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ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

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DISEASES OF THE SKIN AND SYPHILIS.

BY ARTHUR VAN HARLINGEN, M.D.,

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SIMPLE INFLAMMATORY PROCESSES.

Eczema.—A large number of contributions to our knowledge of eczema have been made during the past year—at least, if one may judge by the multitude of articles which have appeared upon this subject. A close examination, however, shows that many of these are re-hashes of old and well-known facts, usually in the form of clinical lectures or essays read before medical societies. Another large portion consists in new (and old) formulæ. Many familiar and venerable recipes continue to circulate in the columns of the medical press and are continually passing and repassing before our view like the figures of some phantasmal “merry-go-round.”

Brunon²⁰³_{Feb.1} gives an interesting paper on eczema of the face, which he regards as chiefly occurring in persons who can be called “arthritics.” The predisposing causes are frequently moral or mental; or the sudden change from heat to cold, excessive fatigue, sudden emotion, mental trouble or excessive mental work, or watching. Excesses of all kinds, especially intellectual, as of young persons undergoing examinations, may be specified as causative. Certain diets also may give rise to this form of eczema.

While sex has little influence, age has, the affection being, according to Brunon, one of adolescence. This is not my experience. I find eczema erythematosum of the face decidedly more common among males and rather among adults and elderly people. Neither can I agree with Brunon in calling it a disease of intellectual and sedentary persons. Car and engine drivers, exposed to cold currents of air, and stokers, exposed to the glare of furnaces, are in America not unfrequently the subjects of this form of disease. As, however, Brunon has chiefly in mind eczema orbicularis, perhaps his deductions may be correct. This form of the disease occurring alone is rare in America. The locality of predi-

lection of eczema orbicularis, says Brunon, is particularly the upper eyelids, from which the affection may spread to the temples and the malar prominences. The eruption is usually symmetrical. Conjunctivitis (subacute) and blepharitis are not uncommon concomitants. A similar condition is apt to be found about the mouth, while the anus and vulva may also be attacked. The causes of eczema are generally such as lead to debility, and, as regards eczema of the face, the patient is in a condition of moral depression, very often on account of the hideous appearance which he presents. Thus, says Brunon, he turns in a vicious circle. He is depressed because he has eczema; he has eczema because he is depressed. In addition, dyspepsia, dilatation of the stomach, constipation, nervous prostration—all may influence the outbreak of this form of eczema. The duration is variable, and is prolonged by the unfortunate peculiarity which this disease presents of going on to the very verge of recovery and then suddenly relapsing. Such relapses may occur repeatedly, extending the course of the disease to months or even a year.

The treatment of this form of eczema is particularly difficult on account of the patient's poor *morale*. But it must be undertaken, in the first place, by studying all his surroundings and, when necessary, removing him to a more favorable locality. The usual tonic treatment, diet, etc., must then be carefully prescribed. The local treatment must be at first prophylactic. The patient is to be protected from all injurious influences. Later, mild stimulating applications may be employed, timidly at first, later more boldly. In connection with the local treatment of palpebral eczema, we may give Sollier's prescription⁶¹: two parts crystallized acetic acid, fifty parts of glycerin, and two hundred parts of distilled cherry-laurel water. To be carefully painted on the edge of the eyelid once a day. It is, of course, a severe stimulant. Bulkley,⁶¹_{May 8} in a paper read before the American Medical Association, on the "Etiology of Eczema," says we must distinguish between the predisposing and the exciting causes of the disease, between the constitutional state or condition, and the special determining causes of the attack, internal and local. He believes that the first element to be recognized is debility in some form or other. Eczema, he thinks (but I believe this to be too wide a generalization), never occurs except as an evidence of lowered vitality, either

general or local. The following scheme represents Bulkley's ideas on this subject very graphically. As a tabulation of the etiology of eczema it seems to me very suggestive :—

CONSTITUTIONAL AND LOCAL CAUSES OF ECZEMA.

Constitutional and General Causes,	{	1. Predisposing,	{	Hereditary, Gouty or arthritic diathesis, Neurotic diathesis, Strumous diathesis.
		2. Exciting,	{	Debility, Digestive disorders, Nervous depression.
Local or External Causes,	{	1. Predisposing,	{	Climatic.
			Occupation,	{ Sedentary, Standing, Irritating.
		2. Exciting,	Diet.	
			Climatic,	{ Sudden exposure to heat and cold, Prolonged exposure.
			Occupation,	{ Long confinement, Long standing, Irritants.
			Diet,	{ Acids, Sweets, Tobacco.
				Irritants,	{ Soaps, Ointments, Scalding, Blister, etc.

Russell Sturgis,^{99 Feb. 23} in eczema of the face and head in children, recommends dusting boric acid plentifully on the weeping surface night and morning for forty-eight hours, not to be washed off until the end of that time. After washing off then with warm water the boric acid is continued as before, only washing off each time previous to the application. So soon as the skin is in a condition to bear an ointment (What is the sign of this?—Ed.) one of two drachms (eight grammes) of boric acid to the ounce (thirty-one grammes) of lanolin is applied. In eczema squamosum, when there is considerable induration with scaly surface, Sturgis first cleans off the scales with plenty of hard rubbing with sweet oil and washing with Castile soap. When the patch is clean, an ointment of five to ten grains (0.32 to 0.65 gramme) of salicylic acid to the ounce of lanolin, according to the degree of induration, is used. In recurrent eczema behind the ears and in intertrigo, Sturgis uses pure powdered boric acid. There is nothing new about his treatment, but the care and thoroughness with which it is applied is always rewarded with success. Sturgis' reliance upon and admiration for lanolin is not shared by most dermatologists. In a

discussion which followed the reading of Sturgis' paper, Davenport said that it is very possible that the varying satisfaction which wool-grease has given to those who have used it may be largely due to the different composition of the commercial varieties which have been dispensed by druggists. Different samples bought in Boston have been found to contain from 1.25 to 22.12 per cent. of free fatty acids. The original lanolin had a large percentage of water worked into it, as is the case with cold cream. Samples bought in Boston have been found to contain from 0 to 23.74 per cent. of water. J. C. White thinks the presence of water is often of material consequence. Experience shows that many skins bear an ointment better if water is mixed with the fat.

Besnier,²¹²_{Apr.} in a clinical lecture, adopts Unna's classification of infantile eczema in three varieties. The first of these is met with in so-called lymphatic children. It is itchy, occurs about the orifices, as the nose and mouth, and often leads to enlargement of the lymphatic glands, which may be the point of departure for tuberculous lesions. (I cannot accept this as occurring in America—at least no record has been made of such facts.) This form of infantile eczema secretes abundantly. It is often accompanied by phlyctenular conjunctivitis. It is connected with "lymphatism" or scrofulo-tuberculosis, and may serve as a field for the pululation of tuberculous germs. It should be considered as of graver prognostic importance than the other forms. The treatment of this form of infantile eczema should be active, because it may become the point of departure for irremediable lesions. Twice a day the affected parts should be bathed with a very weak solution of corrosive sublimate (proportions vaguely given by Besnier) gradually strengthened to pure "liquor Van Swieten." At the same time calomel ointment, fifteen grains (one gramme) to the ounce (thirty-one grammes), followed later by red precipitate ointment, half a grain (0.03 gramme) to the ounce (thirty-one grammes) (?), may be employed cautiously. I give these ointments as reported, but the first is too strong by one-half, and the last might be ten times as strong without equaling the calomel ointment as a stimulant.

The second variety of infantile eczema described by Besnier is that familiar eruption belonging to the first period of infancy and coinciding with dentition. It covers the face like a mask, avoiding, however, the eyes, nose, mouth, and even the fold of the

ears. It often spreads to the back of the hands and wrists. This form of eczema is highly pruriginous. The child's head and face are covered with scratch marks. Signs of buccal irritation are almost always present, sensitiveness of the gums and abundant salivation, indicating the presence of a reflex eczema connected with the process of dentition. The indication is to soothe the nervous system and quiet the irritation of the gums. The means employed by Besnier for this purpose amaze me, but the counsels of such a master must be listened to with respect. He gives the infant a piece of marsh-mallow root to suck and calms the irritation of the gums by gently touching or rubbing them from time to time with the pulp of the finger moistened with the following solution:—

R Cocain. muriat., gr. $1\frac{3}{4}$ (0.1 gramme).
 Potassii bromidi, gr. 16 (1.037 grammes).
 Glycerinæ,
 Aquæ, āā f5 $2\frac{1}{2}$ (9.7 grammes).—M.

As such infants sleep poorly, Besnier gives bromide of potassium internally:—

R Potassii bromidi, gr. 12 (0.78 gramme).
 Syrupi aurantii flor. . . . f5 1 (31. grammes).
 M. Sig.: A teaspoonful every hour until four are taken, which amounts to about six grains, a sufficient dose to obtain the desired effect.

Under this influence alone the irritation and pruritus diminish to a marked degree. But it is desirable to add to this an appropriate local treatment, such as the following:—

R Pulv. zinci oxidi, 5 2 (7.78 grammes).
 Vaselini, 5 6 (23.33 grammes).—M.

This ointment should be retained in place upon the affected parts and the skin at the same time protected from scratching by the use of a mask of muslin or fine rubber cloth.

The third form of eczema differs from the last named by the absence of pruritus, but it occurs in the same localities and, like the former, does not occur about the orifices. It is a seborrhœic eczema, that is, one seated in those parts of the skin where the sebaceous and sudoriparous glands are common. It occurs first upon the hairy scalp, whence it spreads to the eyebrows, then to the face, often to the neck, back, and shoulders, accompanied by more or less thick, greasy crusts. Its chief characteristic, how-

ever, is the abundant desquamation on the scalp, with the thin and sparsely scattered hairs.

This is the most benign form of infantile eczema, and best supports vigorous treatment. The diet and regimen are to be looked after. The hair is to be cut short and the scalp washed with soap. The face is to be washed over the diseased patches with warm water, to which a little milk has been added to form a sort of emulsion, which dissolves the fatty secretion of the skin. The following ointment can then be applied:—

R Pulv. resorcin,	gr. 5 (0.32 gramme).
Pulv. zinci oxidi,	3 1 (3.89 grammes).
Vaselini,	3 1 (31. grammes).—M.

The resorcin may be replaced by sulphur in the proportion of sixty to eighty grains (4 to 5.32 grammes). This ointment should be retained in position by a mask firmly attached over the face by strings.

It is Besnier also, I suppose, who gives some good advice²¹²_{Apr.} on the treatment of eczema of the anus. He says that it is often accompanied by nervous crises due to extreme pruritus and well deserves our best efforts for its relief. Regimen should be strict. All irritants, particularly pepper, and also fish and swine's flesh in any form, which by their facility of decomposition in the alimentary canal give rise to fetid and consequently irritating stools, should be avoided. With the object of disinfecting the stools, the following powder should be taken with each meal:—

R Naphthol, β,	
Bismuthi salicylat.,	āā gr. 3 (0.19 gramme).—M.

If constipation is present, three grains (0.19 gramme) of calcined magnesia (*sic*) should be added to each powder. The patient should take an enema containing fifteen grains (one gramme) of boric acid at each stool.

Patients should wear light clothing and avoid soft, warm seats. Small pieces of soft, non-vulcanized, sheet India rubber should be fastened by strings between the nates, being cleaned every evening with pure, warm water, and then for the first few days changed for poultices of starch, or, still better, of linseed-meal deprived of oil. Later in the treatment, lotions of 1 per cent. solution of nitrate of silver may be applied every few days. An ointment of five grains (0.32 gramme) yellow oxide of mercury to the ounce may be em-

ployed at this period. Mineral waters, such as those of Saint-Gervais, may be used during the course of the treatment.

Brocq,³⁵_{Jan. 5} in a long clinical lecture, giving chiefly Vidal's views on the "treatment of the eczematous," says truly that the patient rather than the disease must be treated. Should all eczematous eruptions be treated? Should the treatment be general or only local? These two questions are first put. As to the first, Brocq says that if we have an acute eczema developing in a person otherwise healthy, we should try to cure it, and as quickly as possible. If, on the other hand, the eczema breaks out in a person who has recurrent bronchitis, asthmatic or gouty attacks, "affections which the cutaneous eruption has happily modified," we should for the time "not suppress this derivation," but, "while watching the eruption and endeavoring to prevent its extension by local applications, treat the general affection, only later and with every precaution attempting to diminish the skin disease and finally make it disappear." I rubbed my eyes on reading the above statement, made by a rising young French dermatologist; but

"Bad begins while worse remains behind,"

for Brocq goes on to say that in chronic eczema, if the patient has no important visceral ailment which alternates with the acute remissions of the eczema, we may try to cure the skin disease. But if in aged, gouty, arthritic, or asthmatic persons we should meet with an eczema of the anus or lower limbs we must treat the skin disease with great caution. "In treating their eczema too energetically one may, indeed, determine the appearance of the gravest pulmonary or even cerebral congestions." Surely these views are superannuated. From two quarters, one in the remote West, the other in that locality where dusky theologians maintain that the "sun do move," we have seen in the past year statements of the danger of "driving in" eruptions of eczema. These we had thought to pass in silence, hoping that they were the last echoes of superstition. But when, in a dermatological centre like Paris, we see such statements gravely made, we ask, Where are the proofs? Have any cases been recently reported of eczemas too rashly cured? Within the last ten years thirty thousand cases of eczema have been reported by dermatologists to the American Dermatological Association. We venture to assert that every one of these cases has been treated with the utmost vigor, and cured as rapidly as circumstances would permit.

And yet no warning voice has risen against the dangers thereby incurred, nor have any fatal congestions of lungs or brain been heard of.

Hebra, after a life-long and enormous experience, asserted that he had never known any ill results from curing eczema, and we are convinced that careful observation will show that his views and that of our American dermatologists are based on scientific facts.

Brocq proceeds next to consider the second point, whether the treatment of eczema should be general or local. Here, while admitting that we are not sure that any internal treatment has a direct effect on the eczematous eruption, he urges attention to the patient's general condition and the employment of all means, medical and hygienic, to bring about a good condition of his general health. It is in acute eczema that internal treatment is most important. The patient's personal and hereditary antecedents must be inquired into, and also the present condition of his viscera. Nothing must be neglected, constitutional vices must be corrected, and a perfect and regular performance of all functions must be obtained if possible. In arthritics alkalies must be prescribed. The mineral waters of Vichy, Vals, and Royat may be employed. (It is a curious fact that the French never recommend German mineral waters, while the Germans carefully ignore the virtues of French springs.) The following formula for an alkaline treatment is also recommended by Brocq:—

R Sodii benzoat,	.	.	.	.	gr. 30 (1.94 grammes).
Sodii bicarbonat,	.	.	.	.	gr. 160 (10.37 grammes).
Syrupi fumitor,					
Aquæ destillat,	.	.	.	ââ f 3 3	(93. grammes).

M. Sig.: Two to four tablespoonfuls daily.

To quiet the nervous condition sometimes produced by the pruritus of eczema, Brocq is far from recommending the bromides, chloral or morphia. In addition to the not unnecessary advice to avoid strong moral and mental emotions, worry, etc., so far as possible, he suggests the employment of valerian in various forms, castoreum, asafetida, and musk. Suppositories containing fifteen grains (one gramme) of asafetida have been used successfully by Vidal. In fact, this is the best form, *i. e.*, by the rectum, to administer such remedies. Salicylate of sodium thirty grains (two grammes) a day, sometimes relieves rebellious pruritus, and antipyrin is

suggested, but without personal experience. Among local preparations, a great number are enumerated by Brocq, beginning at those which are most soothing and which are intended for the most acute stages of the disease. Starch poultices, vulcanized India rubber, soft cloths, "taffetas," wet with boric acid solution, and the usual list of powders, arrowroot, starch, lycopodium, talc, subnitrate of bismuth, and oxide of zinc. In certain cases, of gouty eczema, Brocq uses from the beginning vaseline, perfectly fresh lard or carron-oil. When the acute stage of the eczema is passing away and weeping has ceased, ointments may be tried, at first cautiously—using them by day, and the starch, etc., by night, and gradually substituting the ointments if these are found to agree. An ointment of oxide of zinc, two parts, vaseline, twenty-five parts, may be thinly spread over the surface, and then dusted with a powder of one part oxide of zinc, with or without an equal quantity of subnitrate of bismuth to three of starch. In the case of infants, a little glycerole of starch may be smeared over the surface and then dusted with a similar powder. Oxide of zinc ointment may afterward be used. If this agrees, but does not cure rapidly enough, it may be changed for an ointment containing one part calomel, two parts tannin, and thirty parts glycerole of starch. Besnier uses an ointment of one-half to two parts salicylic acid, twenty-four parts each of starch and oxide of zinc, thirty to forty parts lanolin, and ten to twenty parts vaseline. When an antiseptic effect is required, the following ointment is useful: two to six parts boric acid, thirty parts vaseline, one-half part balsam of Peru. Brocq avoids ointments containing lard, fearing rancidity.

In the impetiginous eczemas of lymphatic subjects more stimulating ointments can be used, as two to five parts oil of cade to thirty parts glycerole of starch, and in impetiginous eczema of the face a rapid cure is sometimes attained by an ointment of one to two parts yellow oxide of mercury to forty parts vaseline. When there is much itching carbolic acid lotions may be applied, but in acute eczema great care must be taken not to use too stimulating applications at first. As Brocq says, our maxim must be: *Primum non nocere*.

The principles laid down by Brocq for the management of chronic eczema are excellent. Chronic eczema is sometimes lighted

up by acute attacks, during which time it must be treated as if acute. Generally, however, strong, and sometimes very strong, measures must be employed. In what may be called moderately chronic eczema with itching, Brocq uses the following tartaric acid ointment, which is new, or at least not used in America, and is worth a trial. It is composed of two parts tartaric acid, one to two parts salicylic acid, and fifty parts glycerole of starch. After applying this, powdered starch should be dusted on the surface, for otherwise the least rubbing will rub off the ointment. In more strictly chronic cases, in addition to tar, potassa, naphthol, etc., with the use of which all are familiar, Brocq harks back to an old prescription of Alibert, perhaps too much forgotten. It is simply solution of nitrate of silver in varying strengths applied until reaction sets in, and then substituted temporarily by an emollient. As regard the treatment of the local varieties of eczema, Brocq has not much to say that is absolutely new, but we may extract the following: For eczema of the nipple, one to two parts pyrogallie acid to twenty parts fresh lard or vaseline. When this has produced a more acute inflammation, poultices, etc., may be employed. In eczema ani an ointment of two parts muriate of morphia, five parts muriate of cocaine, ten parts salicylic acid, twenty parts powdered oxide of zinc or subnitrate of bismuth, forty parts vaseline, and one hundred and sixty parts lanoline.

A correspondent says,²⁸_{Oct.15} that he has suffered from childhood with eczema of the eyelids. The yellow oxide of mercury, ointment commonly employed with success, not only fails to relieve, but irritates the skin. In this case Unna recommends:—

R Resorcini purissimi, gr. 2 (0.13 gramme).
 Ung. aq. rose, gr. 100 (6.5 grammes).—M.
 Rub gently on the eyelid three or four times a day.

If conjunctivitis persists, boric acid lotions may be used, but soap and water are to be avoided.

In those obstinate cases of infantile eczema which occur in infants during the latter half of the first year of life, and when other treatments fail, Boeck³⁶_{Oct.} recommends compresses of a weak solution of nitrate of silver (one to five hundred) alternating with an ointment. The compresses of the nitrate are usually applied, covered with gutta-percha paper, for two or three hours night and morning, and a soothing ointment during the rest of the day and

night. The ung. vaselini plumbicūm suits very well. (The ung. diachyli of the U. S. Pharmacopœia will also suit.—Ed.) This same treatment Bocch considers useful in the moist eczemas of adults.

In eczema ani, Lustgarten advises:—

R Cocaīni oleat.,	f5 ½ (1.94 grammes).
Olei olivæ,	f5 1 (3.89 grammes).
Lanolini,	5 5 (19.44 grammes).—M.

The patient takes a hot sitz bath, made very soapy, morning and evening, subsequently applying the ointment.

Cerasi,¹⁴_{Oct. 21} in the eczema capitis of infants and children, removes any crusts by poultices of starch or linseed, and then applies small compresses wet with a solution of one part of picric acid in one hundred and thirty to one hundred and fifty parts of water. He claims rapid cures.

Our corresponding editor, Ramon de la Sota, of Seville, tells us that Perez Ortiz advises, in the study of eczema, (1) to learn the physio-pathological process; (2) to distinguish carefully the morphological varieties; (3) to study the topography of the disease; (4) to make a precise diagnosis of the causes producing the eczema—all most safe and excellent advice. Our correspondent adds that Azno treats eczema labiorum with iodides and iron internally and locally with flexile collodion containing variously, coal-tar, salicylic acid, tincture of iodine, permanganate of potassium, or boric acid. He thinks the boric acid and tincture of iodine give the best results.

Ulcers.—Jeanselme,¹⁰⁰_{July 28} takes a broader view of the subject of leg ulcers than one is accustomed to associate with this subject. He says that leg ulcer is only one term of a long series of pathological phenomena. In what may be called the “preparatory period,” the varicose limb becomes gradually disorganized; all its constituent parts, skin, nerves, arteries, and veins, undergo more or less marked trophic alteration. The ground prepared, the vitality of the tissues once sufficiently compromised to prevent their offering any efficacious resistance; any pretext, so to speak, is sufficient for ulceration to supervene. A slight injury, the rupture of a varix, an eczema, is enough to cause an almost incurable ulcer. But the ulceration, once established, cannot persist for a long time without being accompanied by more or less grave complications. The tissues modified by varices, atheroma, and nerve alterations

are easily invaded by infectious germs at points denuded by the ulceration or eczema. Numerous attacks of lymphangitis succeed each other, and the period of hypertrophic dermatitis or pachydermia succeeds. If we have the opportunity to examine a limb in the "preparatory" stage, we observe irregular and striking deposits of pigment, which are due to various causes. Sometimes they are connected with deep varices; they are then seen about the malleoli. Sometimes they copy faithfully, under the form of a brownish net-work, the varicose sinuosities of the internal saphenous vein in the lower part of the calf. Sometimes they border a cicatrix of some kind. In all these cases the facility with which pigment forms in the skin of a varicose limb is characteristic. Alterations in the nails are likewise frequently observed. The nail becomes longitudinally striated and shows several deep transverse ridges. It is dull, opaque, grayish, and becomes thickened, not unfrequently assuming a claw-like appearance (arychogryphosis). The hairs of the affected limb diminish in number, so as to show a striking difference when compared with the healthy limb. In the early period, hyperidrosis is sometimes observed. The skin becomes decidedly atrophic in places. Purpuric extravasations may occasionally occur. The nerves of the skin are at times affected, and alterations of tactile and thermic sensibility are noted. The condition of the blood-vessels is of great interest. The varicose veins precede ulceration by a long period—from nine to forty-four years. The large, prominent, knotty varicose veins are not so frequently followed by ulcers as those of vessels of small calibre. This is due to the œdema which accompanies them. Deep varices with small superficial dilatations usually threaten ulcers. The arteries are often involved and atheroma has been observed in a number of cases. Cardiac complications are occasionally observed.

The ulceration resulting from these various cutaneous, vascular, and nervous degenerations is sometimes due to a wound changing into an ulcer, sometimes and very frequently to a ruptured varix. More rarely an inflammatory tumefaction, red and shining, appears at the point about to break down. The skin is smooth, shining, and erysipelas-like. Marked itching causes the patient to scratch; excoriations result and an ulcer follows. Sometimes it is a phlyctenula which, by its rupture, leaves the derma bare and thus becomes the point of departure for an ulcer. Finally, the ordinary

lesions—furuncle, abscess, anthrax—may be the cause, or rather the pretext, for ulceration. After describing at some length the characters of eczema as it occurs on the leg and the peculiar forms assumed by the shallow, multiple ulcer of eczema as distinguished from the varicose ulcer, our author goes on to describe the formation of callosities, and then speaks of the elephantoid condition which often supervenes on inveterate eczematous or varicose ulcer of the leg. This varies in degree in different cases, but is never enormous, as in true elephantiasis. The outlines of the limb are lost. It becomes a cylinder; even the foot, to the very toes, partakes of the deformity. The swelling is mostly œdematous, but the œdema is not compressible, but elastic. It does not pit on pressure and is only slightly relieved by lying in bed or by bandaging. Sometimes the cicatrices of former ulcers strangle the leg about the ankle and cause great deformity. This elephantoid condition of the leg is often complicated by a vegetating dermatitis, particularly about the ankle and the dorsum of the foot, when a warty, papillomatous condition is gradually established, marked by deep folds and curious, irregular deformities. The backs of the toes also are sometimes similarly affected, and the nails, which become onychogryphotic, instead of curving downward occasionally point upward. The trophic disturbances connected with this form of ulceration include, besides the deformities of the nails mentioned, changes in the other appendages of the skin. The hair, at first hypertrophied, later becomes atrophied and falls out, and the sebaceous and sweat secretions are largely suppressed. Finally, pigment patches and purpuric effusions are not unusual. Disturbances of sensation are observed, especially about the neighborhood of the ulcers. Not only touch, but heat and cold, fail to be distinguished. The skin reflexes, even the plantar, are lost. The temperature is almost always, if not invariably, increased. The cause of this is the development of a sheet of new vessels, as has been demonstrated by Ranvier.

After going at some length into the diagnosis of ulcers of the leg and describing the pathology and histology of the lesions, Jeanselme goes on to speak of the treatment. In what he calls the preparatory stage of the disease, the treatment is simple. The patient with varicose limbs should be counseled to avoid wounds and whatever will favor blood stasis and œdema. Elastic stock-

ings should be worn. Eczema, should it appear, is to be vigorously combated. When the ulcerative stage has been reached, it is important to prevent the formation of the pachydermic condition, for when this is once established it is almost impossible to reduce it. The cause of this is found in repeated attacks of lymphangitis about the edge of the ulcer and of eczema, and the prophylactic treatment, therefore, must be directed toward closing the solution of continuity as soon as possible, as this is the origin of the trouble. One of the first points to remember is not to dress the ulcer too frequently. This was advised by Ambroise Paré hundreds of years ago, but it may need repetition at present. Bandages, powders of subcarbonate of iron, iodoform, and unguentum hydrargyri, in particular, are specified by Jeanselme. The infrequent dressings save the ulcer from being torn open and tend to prevent lymphangitis. Of course, rest is desirable, but how rarely can this be preserved through the whole course of treatment! When the ulcer is extensive skin grafting should be practiced. The treatment of varicose eczema in its early stages is likewise important. Rest, starch poultices, boric acid, compresses, and rubber cloth (the latter I counsel to avoid) will usually succeed. The superficial ulcerations of eczema are usually cured by the same means as the eczema itself. Lately Moutard-Martin has succeeded in reducing the pachydermia and destroying the vegetations by cleansing the diseased leg with cataplasms and baths, and then encircling it with a flannel bandage spread thickly with black soap, and covering this with fresher rolls of flannel, without making compression. The whole is covered with rubber tissue and allowed to remain in place for several days. Marked relief is experienced, there is no pain, and the eczema present is not aggravated.

When the pachydermia is established, every effort should be made to reduce it, at least within bounds. Massage, cataplasms, and baths are of use. Also a flannel bandage or Martin's rubber bandage. In some cases the radical cure of the ulcer has been attempted with more or less success. In 1853, Gay suggested a linear incision about one-third of an inch outside, and Dolbeau, in 1862, practiced a similar incision running all around the border of the ulcer with the view of relieving tension. Other practitioners have made numerous scarifications, with the object of softening

and reducing the gristly borders of the ulcer. Amputation must be resorted to in rare cases where a circular ulcer strangles the limb. It should be remembered that the flaps can be practiced through the pachydermic skin with safety.

We have given an abstract of Jeanselme's paper at some length because of the admirable and truly French way in which the whole subject is classified and made clear. The therapeutics, perhaps, leave something to be desired, but the principles he lays down are more valuable than strings of formulæ.

Fontan, ¹⁹⁵_{Aug.} in an article on the "Treatment of Tropical Ulcers," says that these ulcers are chronic, anæmic, sometimes sphacelated, often covered with membranous exudation, and at times phagedenic. They are caused by exposure, privation, and malaria. Considering their known microbic cause in many instances, Fontan has employed spraying with antiseptic solutions. At first 5 per cent. carbolic acid solution was employed, later a saturated solution of boric acid. The sprayings were practiced daily or twice a day for an hour and a half. The dressing between times consisted of a simple compress covered with borated vaseline. The effect of the treatment was striking in removing the disorganized matter, in giving relief from pain when present, and in hastening cicatrization.

Antiseptic treatment is now almost universal in the management of ulcers. Morris ¹⁹⁹_{Sept.} says that the skin about the ulcer is first to be shaved and cleared from epithelial scales. Peroxide of hydrogen is then poured on the ulcer, a few drops at a time for ten minutes. As soon as the peroxide has decomposed all of the discharge from the surface of the ulcer, the sore and the skin near it are washed with a one to two thousand bichloride of mercury solution. This renders the parts aseptic. Balsam of Peru is then poured on a wad of absorbent gauze and this is bandaged on the ulcer. The stimulating wad is renewed every forty-eight hours until a good crop of active granulations has appeared, and then the treatment is changed. The parts having been rendered aseptic, as before, a strip of Lister's protective oiled silk, large enough to cover the ulcer, is soaked in the bichloride solution and placed over the granulations to protect them from the irritation of the discharges. A handful of bichloride cotton is placed over the protective and bandaged in place with an immovable gauze bandage. This dressing should remain in place unchanged for ten days, when

another similar dressing may be applied with the same precautions. If this treatment does not start the healing process actively enough, the patient is placed under ether, and all the indurated tissue is cut out with the sharp spoon. In very large ulcers Morris uses skin transplantations, and when varicose veins are present he makes a long incision up the leg and dissects out the veins, tying the vessels at each extremity of the wound, of course with strict antiseptic precautions. Appenrodt⁶⁹_{p.473; Oct.}⁵ commends massage in the treatment of chronic indurated leg ulcers. The ulcer and the entire limb must first be thoroughly disinfected by a course of antiseptic dressings and washings, lasting for several days; otherwise septic matter may be forced along the lymph channels and multiple abscesses complicate the case. Light *effleurage* is first employed, carefully avoiding strong pressure. Lanolin is used as the inunctive. After massage the limb is again thoroughly washed with soap and disinfected; all raw surfaces are dressed with mull spread with lanolin, covered with tissue-paper (*seidenpapier*). Haborst³³⁶_{No.14} divides the whole leg ulcer lengthways by a deep incision extending into the healthy tissues, after which cross-incisions are made through the callous tissue about half an inch apart. The incisions should be made deep, so that the wounds will gape widely. Hæmorrhage, sometimes profuse, is controlled by tampons. The iodoform dressings used are renewed in eight to fourteen days. Various old and well-known forms of treatment for leg ulcers have been brought forward as new during the past year and need not be mentioned. On the other hand, Wells, of Smithport, Pa.,¹⁸⁶ says that we must guard against closing up a discharging ulcer because we "lock the discharge within the system, for it is an outlet for scrofulous humors which under other circumstances may become tubercular deposits in the lungs or vitiate the blood and ultimately develop organic disease of the kidneys, liver, etc." Hermann, of Kratzerville, Pa., does not go into these fine-spun pathological theories, but simply says that if he were old and had Bright's disease and had a sore of long standing on his leg he would allow no doctor to heal it.

Impetigo Simplex.—The existence of this affection has been denied by some who have regarded the cases as eczema. Duhring⁵_{Oct.} publishes two typical cases, the symptoms of which may be summarized as follows: The lesions are peculiar pustules, which

begin and run their course as such. The process is a simple and benign one, superficial, leaves only a slight pigmentation, which soon passes away, and in the cases cited ran an acute and definite course. The disease is not contagious. The disease is to be distinguished from the "eczema impetiginodes" of older writers, the lesions being discrete, with no disposition to coalesce, variable in size, for the most part as large as a pea or even a finger-nail. They differ from eczematous pustules in possessing thick, firm, resisting walls, with no tendency to break down, rupture, or discharge, and also in being disseminated and in occupying the general surface with no disposition to localize. From impetigo contagiosa the lesions differ from the first in being much more distinctly pustular, in having firmer and thicker walls, and in presenting larger and more bulky crusts; the history of contagion is also wanting; from ecthyma by the fact that in that affection the lesions are flatter, tending to spread on the circumference, yellower, showing a more active pyogenic nature, and more hæmorrhagic, showing a more debilitated state of the tissues, the subsequent crust being brownish. Impetigo occurs in healthy individuals, ecthyma in the broken down.

Simple impetigo must also be distinguished from those pustular lesions which result from external irritants and from animal parasites.

Erythema Caloricum (Burns).—Nikolsky ⁶⁰_{June 16} treats burns of the first and second degree with the following:—

R	Acid. tannic,	51 (4 grammes).
	Alcoholis,	f51 (4 grammes).
	Ætheris sulphurici,	f51 (31 grammes).—M.

This application is made several times daily. The evaporation of the ether and alcohol leaves a thin film of tannin, which relieves the pain and promotes rapid healing. The first application should be preceded by washing with some antiseptic solution. Blisters should be opened to permit the escape of serum. The denuded epidermis should be dusted with a fine powder of iodoform before the tannic acid applications are made. Huntingdon ¹⁴⁷_{Aug.} says that "words cannot portray the horrors attendant upon the old régime of lotions, oils, and salves." He cleanses the burned area with solution of boric acid, dusts it lightly with a powder of equal parts iodoform and subnitrate of bismuth; over this is placed

several layers of iodoform gauze. The dressing is completed by a thick layer of absorbent cotton held in place by an ordinary roller bandage. The local anæsthetic effect of the iodoform rapidly reduces pain to a minimum and nervous shock is correspondingly lessened. Integumentary sloughs are preserved and rendered innocuous; reparative processes, unimpeded by septic infection, are greatly hastened, and the resulting cicatrix is smoother, more elastic and less offensive to the eye than in cases differently treated.

Wende²⁴_{p.249; Sept. 22} speaks highly of a dressing for burns composed of one part of cocaine to twenty-five parts lanoline. The mixture should be freshly prepared and the cocaine perfectly pure. It assuages pain immediately and the healing takes place rapidly. Millish,¹¹⁵_{June} in a prize article, describes a case of very extensive burn which, after a hypodermic of morphia, he dressed (not having the fear of Huntingdon before his eyes) with surgeons' lint saturated with carron-oil and covered with a thick layer of cotton batting. The patient was then put in a warmed bed and bottles of hot water were placed around him. Stimulants were administered, the condition of shock diminished, and in an hour the patient felt comfortable. Next day, after irrigation with boric acid solution, part of the burned surface was covered with sulph-ichthyolate of sodium applied with a camel's hair brush and covered with gutta-percha protective, and the rest was sprinkled with iodoform and subnitrate of bismuth powder and covered with anti-septic gauze saturated with boric acid; the gutta-percha protective was also used here. The patient suffered with bronchitis and diarrhœa and died on the ninth day. The burns were very considerably healed, however, the dressings, or similar ones, having been used throughout. Millish praises the ichthyol, which, though painful at first, at the end of about ten minutes gave great relief.

Ribard,²⁶_{July 2} in burns from oil of vitriol, urges the use of an abundance of cold water. Alkalies or oils which are usually employed are harmful, as oil of vitriol when brought in contact with either of this class of substances gives out heat!

Law¹⁹_{Feb. 11} takes 5 to 10 per cent. solution of carbolic acid in water and a sufficient amount of powdered bicarbonate of sodium to make a paste. This he spreads thickly over the burned area with a knife. He then covers the dressing with layers of absorbent cotton or old muslin or lint saturated in the carbolized water

and fastens it on by a bandage. Immediate relief is the result. The dressing is kept wet with the carbolized water for two days, and is then replaced by a paste of boric acid solution and powdered subnitrate of bismuth. This is allowed to remain until the burn is well, unless pus should form, when it is removed, the burn cleansed, and a fresh application made. If this dressing becomes dry and irritates, it should be moistened with boric acid.

Erysipelas.—Saint Phillippe¹⁸⁸_{Nov. 18} reports a case where a woman, using the tuft which her husband had used to dust his face with rice-flour during an attack of erysipelas a month previously, was seized with purulent ophthalmia and lost an eye. In the same journal Davezac gives a case of that rare complication, phlegmon of the eyelids supervening on a benign attack of facial erysipelas. A cure resulted without deformity. He also gives the case of a young woman of twenty, in fine health, attacked by facial erysipelas, and who showed signs of endocarditis on the third day by a *bruit de souffle* immediately following the first sound, and loudest at the apex. The patient's pulse was one hundred and twelve. She suffered no pain. On the sixth day convalescence was apparently about to set in, when, without known cause, the disease took a fresh start. However, the patient was able to sit up by the twelfth day. On the fourteenth day, after some slight emotion, she rose from stool, complained of pain or sickness at the stomach, and fell dead.

Mëërovitch²⁵_{Nov. 20} gives a very full *résumé* of our knowledge of the bacteriology of erysipelas, with the results of his own experiments. In thirty-one cases of erysipelas of various parts, the affected skin, serum from bullæ, parenchymatous fluid from the cutaneous region affected, blood from remote (healthy) regions, pus from intercurrent abscesses, bursitic and synovitic effusions, etc., and in three of five cases internal organs (liver, spleen and kidneys), were examined. He found that the affected skin in erysipelas invariably contains great numbers of a characteristic streptococcus, which is always present also in the surrounding apparently sound skin to a distance of half an inch from the margin of disease. Other micro-organisms are also found in the older parts of the disease patch. In very grave cases small numbers of the streptococcus can be found in the patient's blood. The streptococcus occurs in all abscesses, etc. In fatal cases it can be found

in the internal organs. The streptococcus of erysipelas has the following characteristics: It grows very readily in a slightly alkaline meat bouillon at 35° to 37° C., the solution becoming turbid even at the end of ten or twelve hours. After twenty-four hours' growth there are seen enormous numbers of chains, consisting of fifteen or twenty links, while, after forty-eight hours, there appear streptococci, composed of fifty, one hundred, and more spheric cocci of various size. These are thought to be arthrospores. The culture preserves its vitality for four or five months. Other forms of cultivating medium bring out morphological varieties. The streptococcus grows most readily in a slightly alkaline medium, less so in a neutral one, while its growth at once ceases after the addition of a most trifling quantity of an acid to the medium kept at the ordinary room temperature. At 35° C., however, the microbe will grow in a slightly acid medium. The temperature of 50° or 60° C. is usually fatal, while 100° C. is surely so.

Mëcrovitch's experiments on the pathogenic power of the streptococcus of erysipelas are interesting. For control purposes the pneumococcus, the staphylococcus aureus and albus, and the micrococcus prodigiosus were inoculated in thirteen animals without producing anything like erysipelas. In forty-four of sixty-two rabbits in which the pure culture of the streptococcus was inoculated, typical erysipelas was developed, which lasted four to eight days, but sometimes longer. The severity of the attack depended upon the number of microbes introduced. One attack of erysipelas made the animal invulnerable for several months. Mëcrovitch says, in opposition to Fehleisen's teachings, that erysipelas is a general constitutional disease and not a local cutaneous affection. The disease remains local if the constitution is strong enough to resist its further entrance. When the organism becomes so weak as not to "digest" the invading microbes, so to speak, the latter rapidly multiply in the blood and parenchymatous organs to bring about a fatal issue.

The internal administration of the pure culture to rabbits arouses no symptoms, but if a catarrhal state has previously been induced the subsequent administration of the cultures gives rise to an intense and extensive gastro-intestinal catarrh, accompanied by fever and sometimes by sero-purulent peritonitis, the issue being either recovery or death. The streptococcus, as has been proved

by experiment, can pass from the maternal organism to that of the intrauterine fœtus. (It will be remembered that Kaltenbach, Runge, and Stratz³¹⁷ Nos. 44, 48, 54; No. 11, 35 some time ago published several cases of intrauterine erysipelas.) Fehleisen asserts that the erysipelas coccus produces only erysipelas, but no suppuration. Other observers believe that the erysipelas streptococcus is in all respects identical with the streptococcus pyogenes. Mëërovitch asserts, as the result of a number of experiments, that both the streptococcus erysipelas and the streptococcus pyogenes, being inoculated on the skin, produce erysipelas, while the inoculation of either in the subcutaneous or intermuscular tissue gives rise to suppuration. He also believes the two microbes to be indential, and that erysipelas, certain progressive phlegmons, and pyæmia, at least pyæmia following phlegmonous erysipelas, are caused by one and the same pathogenic microbe. The streptococcus of erysipelas sown on fresh raw meat produces in animals drowsiness, dilatation of the pupil, muscular weakness, diarrhœa, and death.

Polotebnow^{35 80} p. 574; Apr. publishes a series of comparative observations made by Stükovenkoff as to the value of nitrate of silver and plain cold-water dressings in erysipelas. Sixty-six patients were experimented upon. Sixty-four had "iodiopathic" erysipelas while two had "traumatic" erysipelas. Forty-two were subjected to the nitrate of silver treatment. In 83 per cent. of the cases treated, the local process was arrested and the fever disappeared within four days after the beginning of the treatment, the disease yielding sooner the earlier the paintings were resorted to. In the majority of the cases treated expectantly with cold-water compresses, the affection was subdued between the fourth and the ninth day. The conclusion reached was that the nitrate of silver treatment shortened the duration of the disease one-half. Polotebnow repeated Stükovenoff's experiments on sixty more cases. His experiences were less favorable, and he concludes that nitrate of silver cannot stop the erysipelatous process in the skin, that it possesses no antipyretic qualities, and that it does not prevent renal lesions nor shorten the period of albuminuria. Cerebral and pulmonary complications occur less frequently, but the mortality remains the same. As a general conclusion, he says that nitrate of silver possesses no advantages over the expectant treatment to compensate for the trouble of its use.

Shadewitsch ²¹_{Sept. 17} lauds ichtthyol. At first using it in collodion, he subsequently employed it in ointment with an equal part of lard spread upon the diseased area and a little beyond. On the face no covering was used; on the body paraffine paper. He gives five confirmatory cases. Preobrashenski also has used this remedy in one case successfully, in the formula: Ichthyol and sulphuric ether, each one part; collodion, two parts.

Strisower uses subcutaneous injections of one grain (0.065 gramme) corrosive sublimate, two ounces (sixty-two grammes) distilled water, and twelve grains (0.78 gramme) carbolic acid, which he says cuts the disease short in two to three days. He does not give the dose. I would suggest fifteen minims (one gramme) morning and evening, being one sixty-fourth grain (0.001 gramme) dose.

Ducray ⁴⁵_{Mar. 5} treats erysipelas by hypodermic injections of corrosive sublimate in a one to one thousand solution, around the edge of the eruption at two millimetres from it and three centimetres from each other. The patch is then covered with bichloride of mercury cotton. After twelve hours the procedure is repeated. Large blisters form and the erysipelas heals. The raw places are healed up by boric acid ointment or carron-oil.

"Dr. Aitken," says Hodge, ²³⁵_{Mar.} "warns against the use of iodine locally, especially in erysipelas of the face and neck. He says that several cases of meningitis have followed the use of iodine." I should be glad if he could refer us to the records of meningitis after the use of iodine in which the diagnosis was confirmed post-mortem. Hilton Fagge says that "where there has been severe cerebral symptoms it has often been supposed that inflammation has extended from the scalp or the face to the membranes of the brain. *Post-mortem examinations, however, have very rarely verified these suspicions.*"

Hodge says he has only seen one case of meningitis, and that was when the inflammation spread in through the orbit, producing cellulitis, and so on through the sphenoid fissure. He believes in cold applications, with brandy and egg internally.

Bruns ³³⁶_{p. 629} ⁶²_{Nov. 1} summarizes the cases thus far reported, where erysipelas has been artificially excited to cure—(1) five sarcomas: three cured, two relapsed; (2) six doubtful cases (sarcoma or carcinoma): failure; (3) three ulcerative epitheliomas: failure; (4) two

cicatricial keloids and "several" lymphomas: cure. Fehleisen is the great advocate for this form of treatment.

Erysipeloid.—Under the name of "erysipeloid," Rosbach (see ANNUAL of 1888, vol. ii, p. 357) described a curious affection hitherto not reported on this side of the Atlantic. During the past year, however, Elliot²⁴⁵_{Jan.} has reported the case of a woman of thirty, in good health, who had suffered with two attacks beginning in the palms, but lately occurring on the foot. The last attack began as a small red spot near the centre of the palms, growing larger and moving over the palm in a circinate manner. When first seen the eruption consisted of a zone of violaceous redness, about one-third of an inch broad, only slightly elevated but sharply defined in regard to the unimplicated skin. It began at the root of the middle finger and extended in a more or less curved manner to the upper border of the palm and along this to the ulnar border of the hand, when it ceased abruptly. The space inclosed by this zone was completely normal, but yet it had been the seat of the process. Similar appearances were observed upon the palmar surface of the first phalanx of the middle finger. On the feet the process was represented by a half-circle on the ball of the left foot, while on the right foot the dorsum of the great toe and of the first and second toes were the parts affected. The symptoms were similar to those on the palm. Throughout the course of the disease there had been no desquamation, no papule vesicles or other lesions present, nor did any such objective symptoms develop later. There was severe itching and burning in the affected parts, but no general symptoms. The patient was placed upon

Ammonii sulpho-ichthyolat.,	. . . . .	15 parts ;
Unguent. diachyli, . . . . .	. . . . .	100 parts—M. ;

under the use of which the eruptions entirely disappeared, but relapsed again later. Another course of treatment was followed by a permanent cure. Erysipeloid is to be distinguished from erysipelas by being a purely local process with no general symptoms, by the absence of the swollen, shining, tense, and infiltrated condition noted in the erysipelatous skin, and by its slow progress, narrow red outline, and tendency to scaliness. From ringworm the absence of the fungus is the best criterion of difference. From erythema annulare, which resembles erysipeloid more closely, the former is distinguished by symmetry, by occurring

in characteristic localities, by rapid dissemination, absence of itching, and by its being accompanied by other lesions of erythema multiforme.

Cysticerci of the Skin.—Kahler⁸⁴_{Feb. 15} gives the case of a woman, twenty-three years of age, who had suffered three years with anomalous headache and other nervous symptoms, together with enlargement of the spleen. On examination, numbers of small, firm tumors were observed in the subcutaneous cellular tissue which the patient said had appeared at the same time as the headache, etc. Similar roundish, gristly, smooth, movable, painless tumors could also be perceived on further examination in the subfascial, and by palpation in the muscles. One hundred in all were counted. The tumors were chiefly situated in the subcutaneous or subfascial tissues of the neck, infraclavicular region, the back as low as the scapulæ, and the sulcus of the internal biceps. Also in the pectoral, dorsal, biceps and triceps brachii muscles. Extirpation and examination of one of these tumors showed it to be a cysticercus sac.

Erythema Multiforme.—Under the name of chronic erythema multiforme, Fox²⁴⁵_{Feb.} gives the case of a man who had suffered from the eruption thirteen months. The lesions were present on the body and extremities, having appeared on the latter first and subsequently invaded the former. On the hands, arms, and legs were papules and circinate lesions. There had also been outbreaks on these portions of the surface of bullæ and vesicles. On the body there were only erythematous rings and gyri. There was some itching. The patient's general health was good.

Acne.—Unna²⁸_{p. 54; Apr. 21}¹ divides the acne process into two parts—(1) closure of the sebaceous follicle and formation of comedo; (2) suppuration. In comedo the corneous layer becomes thickened and closes the mouth of the follicle. Suppuration only occurs in those follicles where the *staphylococcus aureus et albus* has penetrated before the comedo formed. The indications are (1) the loosening of the corneous layer of the skin; (2) the extermination of the staphylococcus. In public practice the first indication may be fulfilled by the use of *sapo viridis*, acetic acid, a 5 per cent. solution of caustic potassa, or salicylic acid plaster. In private practice we may use sulphur with carbolic acid, or resorcin with corrosive sublimate. Two or three times a week it is well to scrape

off the whole of the diseased parts with the curette, open all pustules, and squeeze out all comedones. The patients should wash with warm water and soap, and follow this, if the skin is tender, with a powder of oxide of zinc and flour. During the night, ointments, by day lotions, are best, the latter two or three times a day after washing. An ointment of eighty-six parts oxide of zinc ointment, ten of precipitated sulphur, and four of silicious earth may be used at night and followed next day by a lotion of two to five parts resorcin, one of glycerine, twenty of orange-flower water, and eighty of alcohol. Or at night eighty parts zinc ointment and ten each of resorcin and silicious earth, followed during the day by a wash of one-half to two parts corrosive sublimate, one of glycerine, twenty of orange-flower water, and eighty of alcohol. After the acne is nearly well a resorcin paste or wash or a sublimate soap should be used.

ANGIONEUROTIC DERMATOSES.

Erythema Nodosum.—Demme⁵¹_{No.7} has observed a severe form of erythema nodosum occurring in five children, three of one family, suggesting contagion. Violent vomiting, delirium, and stupor came first, then fever to 40° C. (104° F.), immediately followed by the appearance of a widely spread nodular erythema, chiefly upon the legs and forearms. Severe pain developed in the extremities, the elbows, and ankles, unaccompanied by effusion into the joints. Between the fourth and sixth day numerous purpuric spots, attended in one instance with vomiting of blood and bloody evacuations from the bowels, supervened. In two cases several of the nodules became gangrenous. In spite of the rapid exhaustion attending these cases they all recovered. The whole course of the affection resembled that of a severe infectious disease, in which the eruption was an essential feature. The fever, at first high and continuous, fell markedly on the appearance of the erythema nodosum, and was subnormal during the development of the gangrene. No bacteria were discovered in the blood, but in the tissue fluids of the intact nodules, in the bullæ, pustules, and gangrenous patches, micrococci and bacilli were found. Pure cultures of the bacilli, when inoculated upon the abdominal skin of guinea-pigs, produced an eruption of erythematous lumps followed by gangrene. Inoculation of the micrococci produced no result.

Urticaria.—Arning⁶⁹_{Nov.15} reports an extraordinary case of urticaria passing into superficial gangrene in a phthisical girl of fifteen. The lesions, which were situated upon the face, right shoulder, left forearm, and right thigh, began as papular efflorescences, developed into quaddels, and became gangrenous on the surface, finally healing.

Christiani²⁵_{Nov.20} describes the symptoms of malarial urticaria as observed by himself and others. The eruption comes out at the beginning of the second or hot stage, and disappears during the third stage on the advent of free sweating. It reappears with every attack, and is, like the fever, cured by quinine. The eruption comes out chiefly upon the abdomen, the trunk, the limbs, and especially the anterior (extensor) surfaces of the upper arms and thighs. It very rarely affects the neck or face. In this latter position the author has only seen it once, and then in a very severe case—of the comatose type—with prolonged hot stage and very high temperature. In a first attack, and when the temperature does not exceed 104° F. (40° C.), the eruption is usually discrete, but in severe cases it becomes confluent. There is some disagreement regarding the prognostic value of the eruption of urticaria in malaria. Christiani and some other observers consider it of grave import, while dermatologists in general regard it as insignificant,—a view with which I coincide.

S. Prat,¹⁹⁵_{Nov.} in an interesting article on the external and internal forms of urticaria, says that Hardy advises against baths in the acute period, while Bazin regards them as always an excellent means of sedation. He uses both alkaline and acid baths. The following is a useful mercurial bath:—

R Hydrarg. bichlor.,	5 2½	(10.36 grammes).
Alcoholis,	5 30	(116.64 grammes).
Aque,	c. 30.	—M.

Among lotions, cologne-water or vinegar one part, water three parts, may be used with a sponge; chloroform-water followed by powdered starch without drying, or lotion of nitric acid, two to three drops of the strong acid to a quart of water, are useful. A solution of sulphate of atropia, one to two grains (0.065 to 0.13 gramme) to the ounce (31 grammes) of water, applied with a compress over limited areas at a time may be used. A spray of sulphuric ether has been employed with good effect. Internally, ipecac may be given to relieve the stomach when necessary, or

atropia sulphate, one-sixtieth grain (0.0011 gramme), on going to bed, and one-thirtieth (0.0022 gramme) some time in the middle of the night for four or five days. (A too heroic dose. One-half should be enough.—Ed.) Small doses of chloral, bromide of potassium, quinine (in malarial urticaria), hydrobromate of quinine, eight to sixteen grains (0.52 to 1.037 grammes) daily for five days, ergot, arsenic, and occasionally mineral waters may be employed. Vichy, Royat, and Bourboule are those recommended by Prat.

According to Drury,⁵³ Jan. 21 G. H. Fox says one of the best and most convenient external applications in urticaria is alcohol dabbed on the skin with a sponge or soft rag and allowed to evaporate, the patient being cautioned not to rub the parts. Cologne-water with benzoic acid is preferred by some. Of acid lotions, vinegar is the one most generally convenient. Hydrocyanic and nitric acid, largely diluted, often give relief. Gull first recommended the use of chloroform locally by dropping upon the affected parts. Neligan recommends a half a drachm (one gramme) of chloroform rubbed up with an ounce (thirty-one grammes) of cold cream, to be applied thickly over the affected parts. Hardy recommends a lotion of ten parts chloroform and thirty of oil of sweet almonds. Hot mustard foot-baths will sometimes cause the eruption to disappear. Carpenter suggests a solution of ten grains (0.65 gramme) of menthol to the ounce.

Angioneurotic Disease.—Bronson²⁴⁵ Aug. gives the case of a woman, twenty-eight years of age, who had had an eruption of red, itching papules on the inner surface of both wrists, the traces of which remained when she came under Dr. Bronson's observation in March, 1888. In addition, the patient complained of a recurrent exanthem which had occurred at frequent intervals on various portions of the body for some months previously, and which consisted of coin to plate-sized pale or red elevated patches, attended with great irritation. The lesions came out slowly in the latter part of the day and lasted for several hours to a day, disappearing slowly. The attacks had continued ever since with varying severity, coming on almost every day. The color was red, crimson, or purplish; sometimes there was little change of color, but only a swelling. Occasionally the swellings were as large as a flattened orange or larger. They pitted on pressure and were rather soft, occurring most frequently on the face and forehead. The patient

was nervous and despondent, complaining of frequent headaches and dizziness, with occasionally slight bleeding at the nose in the morning. The appetite was poor and the tongue coated. Klotz and Elliot, who saw the case, thought it one of circumscribed oedema. To my mind it seems to resemble the "giant urticaria" described by Tilbury Fox and others.

Rosacea Hypertrophica.—F. H. Gross,^{9 July 21} in an extreme case of hypertrophic rosacea of the nose, carried an incision along the lower free border of both alæ (the edge of the knife being directed upward), and the line of the cut passing through the lobe just above the anterior limit of the columna, through the lumpy masses at that point and on the left ala. To this long incision was joined another, running vertically on the dorsum of the nose from bridge to tip. Two triangular flaps of the thickened integument of the wings of the organ were next dissected up, and the superabundant cellular tissue and lumpy projections were trimmed and scraped away. While doing this any injury to the lower lateral cartilages was avoided. Hæmorrhage was rather copious, as might have been expected from a part so congested, but the free bleeding had its beneficial effect upon the final favorable result. Nine months after the operation the nose presented a normal and shapely appearance.

Morphia as a Cause of Rosacea.—Jackson^{19 Sept. 1} reports three cases of acne rosacea in which the patients were in the habit of using morphia. He endeavors to eliminate other causes of the eruption, but a larger number of cases must be observed before we can consider morphia as among the direct causes of this condition.

NEURITIC DERMATOSES.

Herpes Zoster.—Cases of recurrent herpes zoster have been reported several times during the past year. Von Düring^{28 June} gives a case of zoster femoralis following septic phlegmonitis of the left thigh which has recurred at varying intervals since 1881 to the present time. Recently herpes præputialis has occurred between the attacks of zoster. Düring quotes the few similar cases reported. Elliot^{245 Sept.} reports an unique case of double relapsing herpes zoster of the cervical region. He uses the Paquelin cautery at a red heat in the treatment of the neuralgia of zoster, cauterizing the skin over the origin of the nerves superficially, but not enough to pro-

duce scarring. Mettenheimer³⁸³_{v.32,H.8} reports four cases of herpes zoster occurring in children of five, eight, ten, and sixteen years of age (the latter an adult, I should say). Lee²²_{June 27} says that zoster occurs in about 2 per cent. of the cutaneous diseases of children. He has seen it at as early an age as one year and ten months. It is most common between four and six. As Lee says that the affection follows attacks of indigestion at times and is found on the cheeks, it would seem possible, in connection with the high percentage of cases observed, that some were in reality herpes simplex or eczema. It would at least have been well to have given the data for a differential diagnosis.

HÆMORRHAGIC DERMATOSES.

Purpura.—Willy Levy⁸⁴_{Sept. 8} gives a full and careful history of a somewhat unusual case of purpura. A little girl, eight years of age, enjoying good general health, complained repeatedly, at the beginning of July, 1887, of pains in the arms and legs. About the middle of the month slight transitory œdematous swellings about the left foot and elbow were observed, which disappeared after a few days. Without displaying other marked symptoms, the patient's condition grew rather worse until Levy saw her on the 24th of July. She then kept her bed, with a temperature of 38.3° C. (101 F.) and pulse of one hundred. The left wrist and ankle were swollen and œdematous. Later this disappeared and other circumscribed œdemas appeared on the bridge of the nose, etc. On July 30th small petechiæ were observed about the sacral region and nates. No predilection for hair-follicles. No itching. Temperature normal. No albumen. General languor and increasing pain in the limbs. Two days later the petechial patches above noted had begun to disappear, while great numbers of petechiæ of various size appeared over the chest and abdomen and the extensor surface of both arms. Within a few days the entire surface of the body, excepting the face, showed every color of the rainbow, owing to the various stages of evolution which the lesions of different dates were undergoing, while scattered about were numerous recent bright-red petechiæ, vitrices, and ecchymoses. The dependent portions of the body were most markedly affected. Within the subsequent three or four weeks the patient presented a series of symptoms of marked and varied character, which are detailed

minutely by Levy. Lesions appeared upon the tonsils and pharynx, accompanied by pain in the neck and difficulty in swallowing. The eyelids became œdematous and closed. The pulse fell to sixty degrees. The purpuric eruption upon the skin had ceased to come out by August 10th, and the œdema of the eyelids had disappeared, when a new series of symptoms unfolded themselves. On August 11th there was constipation, the patient complained of cutting and piercing pains in the stomach and right abdominal regions, somewhat relieved by pressure. The pains took on a paroxysmal character, lasting one or two minutes, during which time the patient shrieked with anguish, and were then followed by an interval of a quarter of an hour. These pains lasted several days, growing gradually less intense and with longer intervals. The pulse and temperature were normal. The patient was sleepless and without appetite. One or two firm stools were passed. On August 13th there was bilious vomiting, with a little blood and a fresh onset of abdominal pain, which after some hours passed off with several pure bloody stools. Later fecal stools with some blood were passed. Similar but less-marked symptoms, with a fresh but slight outbreak of new petechiæ continued during the following week. The patient's temperature continued normal, and the pulse usually about seventy-five, but slowing to sixty after some of the attacks. On August 20th the patient was suddenly attacked by a sharp, extremely severe pain in the left elbow-joint, which was exceedingly tender but not swollen, and actively and passively mobile without pain. Next day the elbow showed a bluish-red discoloration. By August 27th the patient seemed convalescent, but anæmic and weak. Several slight relapses of the purpura occurred, however, later, and the patient suffered with pain in the joints and loss of power. Passive movements could always be made without pain. By September 10th the patient could get up and walk about a little. A sudden effusion of blood under the conjunctiva of both eyes occurred about this time, with œdema of the lids, but these symptoms soon disappeared. A few petechiæ continued to appear now and then, and attacks of abdominal pain, usually connected with constipation or some indiscretion in eating, but by the end of September the patient was well.

Levy says that for some days his patient was supposed to be

suffering from articular rheumatism. When the eruption occurred peliosis or purpura rheumatica was thought of. But this name covers a great variety of purpuras, some very different from those first described by Schönlein; and when, later in the history of the case, the hæmorrhages from mucous membranes and the other varied symptoms appeared, Levy came to the conclusion that the case was neither one of P. rheumatica nor of P. hæmorrhagica, but either of a transition character, or, perhaps, the expression of a transitory hæmophilia. The peculiar abdominal symptoms which appeared at the end of the third week—vomiting, hæmorrhage from the bowels, colic, and tenesmus—showed, of course, the presence of hæmorrhage into the intestinal tract. These symptoms brought the case into accord with the six reported by Henoch (to which several others have since been added by other authors), and of which Levy gives an abstract. He then goes on to give a differential diagnosis, separating his cases from the hæmorrhagic exanthemata, from hæmophilia, scorbutus, purpura simplex, purpura hæmorrhagica, and purpura rheumatica. Levy then comments upon Scheby-Buch's admirable article on this form of purpura, in which this author maintains that P. simplex, P. hæmorrhagica, and P. rheumatica belong to the same group. For the reasons given in his review of these authors, Levy concludes by regarding his case as belonging to a transition form of this kind of purpura.

Several cases of *purpura foudroyant* (fulminant purpura), as the shocking affection is called by the French, have been reported during the past year. Hervé¹¹⁸_{Apr.} was called on November 5th, 1887, in the afternoon, to see an infant of three months, whose parents lodged in a dark and ill-ventilated dwelling. The child, who had been raised at the breast, had been well until twenty-four hours previously, since which time she had appeared to be suffering and oppressed, and had slept badly. On examination the little patient's face was pale and anxious, the respiratory movements frequent, the pulse rapid. Some few mucous râles could be heard in the chest; the throat, heart, and abdomen presented nothing abnormal. There was no diarrhœa and no vomiting. A dozen hæmorrhagic patches the size of a ten-cent piece could be seen scattered over the legs, thighs, and abdomen. The infant's mother had not seen them before, so they had probably just

appeared. About three hours later, at 6 P.M., examination showed the hæmorrhagic patches much more numerous and extensive, covering the limbs and trunk and invading the face, particularly the forehead and eyelids. The pulse was so feeble and rapid that it could not be counted. There was extreme agitation, and the little patient cried unceasingly, while taking the breast with avidity. No hæmorrhage into the mucous membranes. By 10 P.M. the hæmorrhagic patches were really in sheets, the lower limbs being violet, with some œdema, and cold to the touch, while the abdomen was covered with enormous ecchymoses, and the face and hands with numbers of small ones. No melæna, epistaxis, nor hæmaturia. Death occurred at midnight, nine hours after Hervé had first seen the patient and from the beginning of the eruption. Hervé calls attention to the rarity of this form of purpura. Three cases have been reported by Guellive, ²¹²_{Apr '24} two by Henoch, and one by Rinonapoli. ¹¹⁸_{Mar.} The latter was that of a child two and a half years old, who had shown, forty-eight hours previously to examination, a quarter-dollar-sized hæmorrhagic patch below the left ham. Besides this there was only general malaise. On looking carefully over the little patient's body, petechiæ were observed over the thoracic and abdominal region, and about the flexor surface of the articulations, with somewhat similar but larger lesions elsewhere. The temperature was nearly normal, the pulse one hundred and fourteen. The surface was sensitive to the touch in the neighborhood of the lesions. No albumen nor sugar in the urine. Next day outbreak of new lesions, some bullar, containing sero-sanguinolent fluid. Pulse one hundred and twenty, mitral murmur with the first cardiac sound. Next day, all symptoms aggravated. The patient became paler, the temperature rose slowly, the pulse became quicker and thready. The child died of exhaustion on the third day after he was first seen by Dr. Rinonapoli.

Cases somewhat similar to the above given have also been reported by Ström and Arctanders. ¹³_{B4:214, No. 5 '87} Ström's case was that of a two and a half year old child, who, a few days after recovery from an attack of scarlatina, was attacked by purpura with œdema of one leg, with fever and a bloody mucous epistaxis. Gangrene of the affected part followed, with extension of the purpuric eruption. The pulse became weak while the heart-sounds were normal. Albumen appeared in the urine and the patient

died in forty-eight hours. (Fuller notes of this case are given in the *SATELLITE* for November, 1887, page 107.) Arctander's case was that of a child, three years of age, in whom a purpuric eruption suddenly appeared, first on one lower limb and then on the other, in large areas, with a feeling of coolness, swelling, and tension. Restlessness and thirst were observed. There were no hæmorrhages into mucous membranes. The ecchymoses spread with the formation of bloody and serous bullæ. The patient's urine showed albumen, and death occurred on the third day. The appearance of the lesions before death indicated that gangrene would have supervened had the patient lived.

Such rare cases are of interest as enabling us to form a mental picture of this striking and terrifying disease, but I cannot but wonder at the apparent absence of any attempt to save the patients' lives. While careful clinical observations were being made, we have no history of transfusion, hypodermic injections of ergotine, etc., which one would think should have been employed.

Martin de Guimard, in a recent thesis,²¹⁷_{Sept. 8} speaking of the treatment of purpura simplex, says that two indications are to be filled: (1) to arrest the hæmorrhages; (2) to remedy the weakness of the patient. For the first indication perchloride of iron (*Tr. ferri. chlor.*) in twenty- to thirty- drop doses, or more, a day, according to the patient's tolerance, may be given to an adult. Freshly powdered ergot to the amount of fifteen grains (one gramme) daily, or ergotine (dose not given, but probably five grains (0.32 gramme) hypodermically dissolved in fifteen minims (one gramme) water, and filtered. The juice of four or five lemons given by the spoonful with sugar, and, above all, oil of turpentine, in doses of ten to twenty drops in emulsion, may be administered. To sustain the weakened forces of the patient, Muscat or Malaga wine or brandy and water may be given; also quinine in large doses (sixteen grains [1.04 grammes] daily), bouillon, or prepared meat-juice. In excessive weakness from hæmorrhage, transfusion has been employed in children with success. Locally, insufflations of antipyrine or tamponing the nasal passages, lemon-juice to the gums, ice to the abdomen, according to the part affected, may be used. If gangrene occurs, antiseptic lotions of carbolic acid (2 per cent.) or corrosive sublimate (1 per 1000) may be employed. Guimard's

thesis is of considerable interest, being based on two careful observations made by himself of infants suffering from purpura gangrenosa. In one, recovery occurred with slow, painful, and deforming cicatrization. In the other a fatal result ensued. It seems that purpura sometimes appears in an almost epidemic form. Twelve cases were received in the *Hôpital des Enfants Malades* between April, 1887, and January, 1888. The variety of purpura studied by Guimard not only displays hæmorrhages into the skin and mucous membranes, local œdema, etc., but likewise marked symptoms referable to the digestive tube. Besides hæmorrhages from the mouth, stomach, and intestine, vomiting, sometimes irrepressible, not only of food but of bile, etc., remind one of lead poisoning. These coincide with the attacks of hæmorrhage from the mouth. Diarrhœa may be profuse, the tongue is pale, there is thirst and sometimes icterus. Hæmaturia and markedly intermittent albuminuria have been observed, indicating discharges of microbes, says Guimard. The nervous system is not markedly affected, if we except cases where pseudo-meningitis or transitory paraplegia occur. The patients present the appearance of anæmia, with debility and prostration. Guimard regards the tendency to irregular and repeated attacks to the repullulation of microbes. He does not think the various varieties of purpura described by authors sufficiently distinct from one another to merit special designations. Intermediate or transition forms connect each one with the others.

The transmission of purpura from mother to fœtus is attested by an observation of Dohan. The mother had had purpura during the last weeks of gestation, but the purpuric eruption had disappeared completely before labor set in. The infant, however, was born with an abundant purpuric eruption which had evidently, in part, appeared some little time before birth. A few lesions appeared in the first few days after birth, but all the eruptions had disappeared by the time the child was ten days old. Guimard regards this fact of the transmission of the disease from mother to fœtus as an argument in favor of the infectious character of the disease. He found in the purpuric patches of one case, as well as in some of the viscera, collections of micrococci. Similar discoveries have been made by Balzer, Klebs (*monas hæmorrhagica*), Watson, Cheyne, Wickham, Legg, Reber, Ceci, and

Hlava. The researches of these observers have not been altogether convincing, but Guimard has been able not only to find micrococci, but after pure cultivation to introduce them into the bodies of rabbits, etc., and to produce purpuric eruptions. He explains the pathogenesis of the purpuric lesions as being due to the mechanical obstruction caused by the micrococci and also by the inflammation produced by their presence. The exact nature of the micrococci has not yet been determined.

Scurvy.—F. P. Henry¹⁹ June 16 says there is no ground for believing that scurvy is due to a micrococcus; it is a disease of alimentation. Personal predisposition, bad hygienic surroundings, severe labor, and depressing emotions are all predisposing causes. In a patient examined by Dr. Henry the blood contained two million seven hundred and seventy-five thousand red corpuscles per cubic millimetre, *i.e.*, 55 per cent. of the normal number, while the coloring matter was only 30 per cent. of the normal. In another case the red corpuscles numbered only one million nine hundred and eighty thousand, *i.e.*, their percentage was only 39. In speaking of the skin affections of scurvy, Henry says that the gums around the teeth only are swollen and puffy. If there is a gap between the teeth the gum is normal. Small petechial spots appear in the skin surrounding the hair-follicles. Sometimes bloody blebs appear. The bleb or vesicle may rupture and the base ulcerate. Sometimes extravasations take place in the subcutaneous tissues, large bruise-like patches occurring on the lower limbs. Extravasations into the connective tissue and muscles may give rise to great pain, swelling, and loss of movement in the affected limb. The calf of the leg, the popliteal space, and the loose connective tissue around the tendo Achillis are favorite sites of these extravasations, but the muscles of the thighs and trunk, such as the recti abdominis and the pectorales, may be attacked. The swellings may be at first soft, later of a board-like hardness. The skin covering them sometimes inflames and suppurates, giving exit to grumous blood and leaving behind an ulcerating cavity. Epistaxis, enterorrhagia, hæmaturia, may occur. The treatment, in addition to a proper diet, containing, of course, potatoes, is tincture of myrrh and chlorate of potassium for the mouth, with painting with nitrate of silver if required. Internally lemon-juice and Blaud's iron pills.

Tears of Blood.—Damalix⁵⁹ cites two cases reported by Hasner and Brun where the eyes filled quickly with bloody tears. The affection is quite independent of any ocular or conjunctival disease, and the attacks are irregular. No cause is known. In some cases the escape of tears is unattended with pain. In others the patient experiences pain in the forehead, the eyebrow, and at the root of the nose, or a sensation of pruritus, formication, or heat in the eyelids. These morbid sensations precede the appearance of tears only a few minutes and disappear when the flow begins. The latter itself lasts only a few minutes, the amount of bloody lachrymation varying from a few drops to a wineglassful. The phenomenon is intermittent and is attended by various hæmorrhages from cutaneous or mucous surfaces. Sanguineous lachrymation appears by preference in anæmic individuals, in those inclined to hæmophilia, and in hysterical women.

IDIONEUROSES.

Pruritus.—The contributions to our knowledge of pruritus during the past year have been almost entirely therapeutic and mostly in the form of drugs or formulæ intended to allay itching. Julia Carpenter⁵³_{Sept. 22} reports a case of senile pruritus completely cured by the faradic current. The patient, a man of seventy-four, complained of intolerable itching of the skin of the ankles and calves, recurring each summer for eight years, coming on at night and causing loss of sleep. The faradic current was used three times a week for two weeks, then twice a week for two weeks, and then once a week a few times. After the first application the pruritus vanished, and, except once slightly, did not return. An interesting point is, that though the passage of the wet electrodes over the skin could be perceived, the strongest current of electricity could not be felt. The case is of interest in connection with Hardaway's statement⁶⁵_{June, '83} that he had employed all manner of electrical treatment, general and local, galvanic and faradic, but, aside from temporary relief to the itching, he had accomplished no permanent good.

At the *Hôpital St. Louis*²¹²_{Apr.} salicylic acid is used in the treatment of pruritus senilis. Hot baths, 104° F. (40° C.), with starch, are employed nightly, and after these the surface of the body is sponged with a mixture of one part of carbolic acid to fifty of aromatic vinegar in a bowl of hot water. Subsequently the sur-

face is powdered with a mixture of one part salicylate of bismuth to nine parts starch. Salicylic acid can be substituted for the salicylate of bismuth. The powder should be gently rubbed into the skin with the palm of the hand. Icard⁹_{Nov.10} cured a case of intolerable pruritus of nine months' standing by the internal administration of forty-five grains (three grammes) salicylate of sodium daily. In pruritus scroti, Vidal uses in extreme cases, where all else has failed, multiple scarification with Balmano Squire's apparatus (a sixteen-bladed instrument).

In *pruritus ani* the following is suggested²²_{Aug.1}: thirty parts hyposulphite of sodium, five parts carbolic acid, sixteen parts glycerin, and two hundred and forty parts distilled water. Bathe the part with cold water, and afterward apply the lotion on cotton wadding. Sutton finds the faradic current used for five minutes at a time for a few days to give entire relief.

In *pruritus pudendi*, Armand Routh²_{v.1,p.793} recommends peppermint-water. A teaspoonful of borax is put into a pint bottle of hot water, and five drops of oil of peppermint is added with thorough shaking. The parts affected are to be freely bathed with a soft sponge. Where there are cracks in the skin, as in eczema, five grains (0.32 gramme) of iodoform to the ounce (31 grammes) of olive-oil is more useful. (It makes the patient an outcast while the treatment lasts, however.)

In pruritus ani,⁹_{Oct.20} one to two parts muriate of cocaine, three hundred parts purest lanolin, and two hundred parts each of vaseline and olive-oil may be used. The addition of seventy parts flowers of sulphur to this prescription has proved useful.

Winter Itch, Prairie Itch, etc.—Our journals have teemed during the past year with fragmentary contributions, chiefly in the form of letters from Western physicians, who have themselves experienced, or who have met in practice with, various pruritic affections, to which they give the names of "Michigan itch," "prairie itch," "Missouri mange," "Illinois mange," etc., etc. Two points are noticeable in these contributions to medical science: one is the apparent ignorance of what has been written regarding diseases of the skin, the other is the careless and imperfect manner in which cases are reported. Even if the general ignorance regarding pruritic skin diseases which is assumed in these papers really prevailed, tons of such contributions would

throw no light upon the subject. No stronger argument for a higher standard of medical education could be brought forward than these displays of unscientific and careless observation. Hand-in-hand with such ignorance goes the want of appreciation of the work of others, as will be seen in what we shall quote. An anonymous correspondent, writing from Franklinsville, N. Y.,⁵⁹ Mar. 3 gives a brief account under the heading of "winter itch" of his own case, where pruritus involving the extensor surface of the thighs, and worse in the evening and on approaching a fire, developed after exposure to cold. This has returned for seven years each winter, disappearing in spring. The greatest relief has been gained by wearing heavy flannel underclothing. Another writer says he has seen forty or fifty cases of winter itch within five years. He says it seems to be an eczema followed by intense itching after retiring and getting warm in bed. It is confined to the extensor *muscles* (*sic*) of the thighs and forearms, frequently covering the abdomen and around the scrotum, sometimes the back. He has never seen it on the feet or hands. It usually selects those surfaces covered by the clothing. He believes it to be contagious, from the fact that he has known a whole family to be affected by it, or one person sleeping with another to impart it to his bed-fellow. In some cases he has seen it assume the pustular form on the forearms and wrists. Shades of Willan and Bateman! Is it possible that reading over his own excellent pen-picture the author does not recognize scabies? And this in a country where four native text-books have been published within a year! A victim of nine years' standing describes, though vaguely, the symptoms of pruritus hiemalis, tells how he consulted Flint in New York, Auspitz and Benedict in Vienna, G. H. Fox in New York, and various dermatologists in St. Louis, Hot Springs, and Kansas City, "who gave varying diagnoses." We will not quote further from these various writers, but call attention to an article on "Divers Species of Itch," by George H. Fox, of New York,⁵⁹ May 5 where this accomplished dermatologist puts the whole matter on a clear and intelligible footing. As an instance of what was said above regarding the loose statements of amateur dermatologists, the above writer says that Dr. Fox diagnosed eczema. Fox, referring to his notes, finds that he had consulted him for an entirely different affection from that which he describes, namely, eczema of the scalp and beard! Fox exam-

ines briefly the various statements which have been made regarding the symptoms of this mysterious Western disease, and concludes that all cases of so-called "prairie itch" may be classed as: (1) scabies, (2) pediculosis, (3) pruritus cutaneus, (4) urticaria, (5) eczema. Corlett, the well-known dermatologist, of Cleveland, in an article on the subject^{1:89}_{June} says there is no material for a new disease, but ignorance of old ones.

EPIDERMIDOSES.

Keratosiis Folliculariis—*Tylosiis*.—Neely²⁴⁵_{Apr.} gives the case of a negro boy of sixteen who had suffered with tylosis of the feet, certainly since three years of age, and probably longer, the affection growing gradually worse year by year. When reported this cornification was half an inch thick at its thinnest point, the middle of the sole. At the edges it was much thicker. It was deeply fissured but gave no inconvenience, save as an impediment to locomotion. At between three and four years of age the disease appeared on the dorsum of the feet, and when examined by Dr. Neely both feet and legs were involved to a point above the knee by a sort of papillary growth, harsh, coarse, and greasy to the touch, and which was found on examination to be composed of hypertrophied and cornified sebaceous secretion, in fact, a keratosiis. Within three years the palms of the hands had become involved in the tylosis, while the backs showed, on examination, somewhat the condition of keratosiis observed on the legs. A mild degree of keratosiis pilariis resembling goose-skin existed over the whole surface of the body. The patient was put upon a treatment including iron, strychnia, and arsenic, with local applications of strong soap. He disappeared, however, soon after.

Lichen Ruber Planus and Acuminatus.—Considerable discussion is going on, both in this country and Europe, on the nature of lichen ruber planus, and on its differentiation from lichen ruber acuminatus, if such an affection exists, which we believe is denied by some. Elliot, of New York,²⁴⁵_{Sept.} gives a case of each variety. The first (lichen ruber planus) occurred in a stout, well-made, apparently healthy American woman, twenty-one years of age. The eruption had begun a year previously upon the flexor surfaces of the forearms as red, itchy, dry lesions of various sizes, which continued to appear until the patient was seen by Dr. Elliot.

Besides the forearms, the arms also showed a number of lesions, and the shoulders, hips, and mouth also showed a few lesions, as well as the palms of the hands. There were none on the lower extremities. On the mucous membrane of the lower lip there was an irregularly circular lesion the size of a dime, the circumference of which was formed by six small elevated papules covered with whitish epithelium. The central portion had sunken in, being on a level with the mucous membrane of the rest of the lip, and was covered with ragged epithelium. The papules were sharply defined and there was no induration at the base of the lesion which had been first noticed one month before. There was some itching. On the mucous membrane of the left cheek there was another lesion, and two well-defined, slightly elevated, flattened lesions, covered with but little epithelium, of a pink, waxy color, could be seen on the tongue. The eruption on the body and extremities consisted of discrete lesions of various size, but mostly as large as a pea. These were very itchy, and had been for the most part scratched so severely that pieces had been dug out of them. Careful examination, however, showed characteristic pale, pink, waxy lesions more or less angular in shape, with a flat top and slightly concave in the centre, and larger ones with rounded tops. There were also brownish discolorations. The presence of lesions on the mucous membranes enhances the difficulty of the diagnosis.

This affection is most apt to be confounded with the papular syphiloderm. We throw Elliot's differential diagnosis into a tabular form for convenience of reference. It is as follows:—

LICHEN RUBER PLANUS.

1. Runs a chronic course.
2. Itching severe.
3. No general systemic disturbance.
4. Lesions angular, with flat tops, pale pink in color, and waxy in appearance; often show a small concavity or depression in their centre.

In a few instances (*L. obtusus*) the lesions are rounded on top and without any depression.

5. The lesions of the mucous surface

SYPHILODERMA PAPULOSUM.

1. Lasts six weeks to two months if not treated. Rarely longer by repeated relapses.

When it occurs late in the disease lesions apt to be grouped and serpiginous.

2. No itching.
3. General systemic symptoms, enlarged glands, nocturnal pains, etc.
4. Lesions rounded, sharply defined, deep coppery red, infiltrated, of various sizes.

5. The lesion of the mucous surface

(mouth) are elevated papules flattened on top and of a whitish color.

They run a chronic course, sometimes atrophy in the centre, but do not ulcerate. No glandular involvement, even when they occur on the lip.

("mucous patch") is sharply circumscribed, covered with reddened or opalescent epithelium.

Tend to recur after lasting some time. Ulcerate. Often glandular enlargement or other systemic symptoms.

Elliot's case of *lichen ruber acuminatus* occurred in an unmarried American woman of twenty-five. The eruption appeared in December, 1886, coming out first under the form of papules, red, very itchy, and slightly scaly. The eruption spread until, when examined by Elliot in March, 1887, it was on the abdomen, thighs, back, chest, and neck, and to a less extent on the extremities. The face was free. The lesions were arranged in diffuse patches, for the most part composed of small conical papules the size of a pin-head, which had developed around the hair-follicle. Small epidermic scales could be seen upon them. They were mostly red, but some were brownish. Among these lesions were also seen quite a number of larger size, angular, pink, waxy, and showing a slight concavity in the centre—lichen planus lesions. The patient said the acuminate lesions had remained unchanged from the first, excepting that new ones appeared and the patches became more dense. The itching was intense and paroxysmal. The patient was exceedingly nervous and irritable. She was not very strong, had lost flesh, and was rather anæmic, but her general functions were normal.

The acuminate form of lichen ruber is rarely met with and requires considerable care in making the diagnosis. The primary lesions are small, conical, and develop around the hair-follicle, do not increase in size, and always remain papules—that is, do not become vesicles or pustules, or undergo any further change. The lesions become confluent through the cropping up of new papules between the primary ones. Small scales of epidermis are present. The affection is a chronic one, excessively itchy, very rebellious to treatment, and death often results from marasmus.

It should be said that most New York dermatologists, who have, in this country, had the best opportunity of studying the disease, believe lichen ruber acuminatus to be a different disease entirely from lichen ruber planus.²⁴⁵

Punctate psoriasis on its first appearance is liable to be mistaken for lichen ruber acuminatus, but the lesions soon enlarge

and become characteristic. In eczema, vesicles and small pustules with crusts are very apt to be present. An eczema will always show more or less evidence of exudation on some part of the surface. In lichen ruber acuminatus, however, the lesions are and remain papules.

Regarding the treatment of lichen ruber, Elliot says that arsenic is useful but must be given in rapidly increasing doses until the patient's point of toleration is reached, and then gradually diminished. He prefers the so-called Asiatic pill (arsenious acid, two parts; powdered black pepper, fifteen parts, and sugar of milk, seventy-eight parts.—M. One grain [0.065 gramme] contains one-fiftieth grain [0.0013 gramme] arsenious acid.—Ed.) Locally, we have a valuable and rapidly acting treatment in the corrosive sublimate and carbolic acid ointment devised by Unna:—

R Hydrarg. bichlor.,	.	.	gr. 2 to 16 (0.13 to 1.037 grammes).
Acidi carbolicci,	.	.	gr. 2 to 20 (0.13 to 1.3 grammes).
Ung. diachyli (Hebra),	.	$\frac{5}{1}$	(31. grammes).

It is best to begin with a small proportion of the corrosive sublimate and gradually increase it until some effect is noted. There does not seem to be any reason to fear the amount of bichloride used, especially if the patient is carefully watched. Elliot has used it to the exclusion of internal treatment with excellent effect. The larger infiltrated lesions of lichen planus may be treated with an ointment of two per cent. salicylic acid, seven per cent. resorcin, and ninety per cent. diachylon ointment during the day, Unna's ointment being employed at night. An interesting contribution to our knowledge of lichen ruber is that of S. Róna,²⁸ May 1, our correspondent in Buda-Pesth, which we have not space to include, but which will be published in full in the *SATELLITE*. In this country Robinson and others have contributed valuable papers, read at the meeting of the American Dermatological Association, but these have not yet reached me.

Psoriasis.—Emil Ries,⁴⁵ July, Oct. in an exhaustive review of this subject, first gives the literature of the subject a general review, classifying the studies of dermatological authors under the anatomical heads of (1) subcutaneous cellular tissue, (2) cutis, (3) papillary layer, (4) rete, (5) stratum granulosum, (7) stratum lucidum, (8) stratum corneum, (9) appendages of the skin, (10) central nervous system, (11) blood, (12) parasites, and gives a

résumé of the pathological anatomy of the subject. Ries then gives a comparative sketch of the etiology of the disease, and follows with an abstract of the views of Auspitz, Robinson, and others, regarding the anatomy of the lesion and its mode of development, which differ widely from one another. Little less difference exists regarding the nature of psoriasis. Four theories exist: (1) the inflammatory theory, (2) the hypertrophic theory, (3) the dystrophic or chemical theory, (4) the parasitic theory. The subject is to be continued. We give this brief review chiefly to direct students to the sources of our present knowledge on the subject of psoriasis. The examination of the numerous papers and the classification of their results make this a very valuable paper for reference.

Bourdillon, in a recent thesis, "*Psoriasis et Arthropathies*," ²¹¹_{Oct. 28} inspired by Professor Besnier, and giving notes of thirty-six cases, comes to the following conclusions: In a certain number of psoriasis patients there exist—(1) variously seated pains, neuralgias, myalgias, melalgias; (2) articular affections, varying from simple arthralgia to arthropathies properly so called. The bond which unites these to the psoriasis is so close that the connection between them cannot be mistaken. In some few cases the arthropathies appear before the eruption, sometimes simultaneously with it, but more frequently the psoriasis appears first. Bourdillon considers that the joint troubles, myalgias, neuralgias, etc., found with psoriasis, are of peripheral or rather medullary nerve origin. This corresponds to the "trophic" theory of the nature of psoriasis now somewhat in vogue. The arthritic troubles met with in psoriasis are more grave than most forms and should give a more serious aspect to the prognosis than is usually admitted by writers. The treatment includes bromide of potassium and opium, which give most relief. Salicylate of sodium fails, and antipyrin is apt to bring out a rash of its own. Baths at a temperature of 86° to 94° F. (30° to 34.44° C.), continued for five or six hours, give great relief.

At a meeting of the New York Dermatological Society, Sherwell²⁴⁵_{Mar.} presented a child, six and a quarter years old, who had suffered with psoriasis for about five months. R. W. Taylor recalled a case he had seen in a child three years old, and Elliot said he had reported a case⁵⁹_{July, '96} which had begun at thirteen

months, and which, when he saw it at eighteen months, showed numerous lesions over the head, body, and extremities, and even the palms and soles.

Ilłin, of Warsaw,²⁵_{June 29} has used Corlett's treatment of bromide of arsenic with brilliant result in two obstinate cases of psoriasis. The formula used was:—

R Arsen. bromidi,	.	.	.	.	gr. 1 (0.065 gramme).
Syrupi simplicis,	.	.	.	.	f 5 2 (62.2 grammes).
Aquæ,	.	.	.	.	f 5 8 (248.8 grammes).—M.

A teaspoonful to be taken two or three times daily, after meals.

Iodide of potassium, by dint of constant puffing, is being pushed into a place among the remedies for psoriasis. From one hundred to five hundred grains (6.5 to 32.4 grammes) are given daily!

Tricorrhexis Nodosa and Sycosis. — Gioranni,¹_{Apr. 21} of Bologna, has examined the hairs in this affection, and finds them mostly to possess a triangular contour on cross-section. They first split with two or three large fibres before the hair becomes fringed out. In sycosis the affected hairs are always thicker than normal, and their contour is more or less notched, so that the hair presents irregular projections, which may number anywhere from two to six. In the middle of the hairs are various broad and irregular cavities filled with pigment, fat, and detritus. These are sometimes so numerous as to occupy nearly all the substance of the hair. It is possible that these thick hairs may be produced by the growing together of several hairs from the same follicle. These large hairs act as irritants.

Shepherd, of Montreal,¹³⁰_{Mar.} describes a case of tricorrhexis nodosa, and Allen Jamieson²⁶_{June} one of "nodosa hairs," the difference between the two varieties being apparently that in the first the hairs tend to break off short through the nodes, while in the latter the fracture takes place in the internodal spaces. Dr. Shepherd's case occurred, as is usual, in the moustache and eyebrows of a man, while Jamieson's affected the hairy scalp of a boy four years of age. The boy's scalp was fairly well covered with dark hair, nowhere more than half an inch in length and in most places still shorter. It felt harsh and wiry to the hand passed over it. On examining the hairs under the microscope, most of them showed more or less distinctly a regular alternation

of swellings and contractions. The nodes were pigmented, the contracted portions devoid of color. It was found by experiment that each node took two days to grow. The contraction and node formation did not take place within the follicle, but first appeared on the hair-shaft, a short distance beyond its point of exit from the follicle. Two other children, a boy of six and a girl of two, presumably of the same family, were similarly affected, but to a less degree.

Anomaly of Color in the Hair.—Falkenheim⁴⁵ gives, with a bibliography, the case of a man of thirty-three, whose hair, at least upon the scalp, was curiously variegated, being in irregular portions of the hair-shaft colorless and pigmented by turns. The peculiarity of the case lay in the irregular distribution of pigment. In cases hitherto reported, the ringed hairs were divided into pretty regular bands.

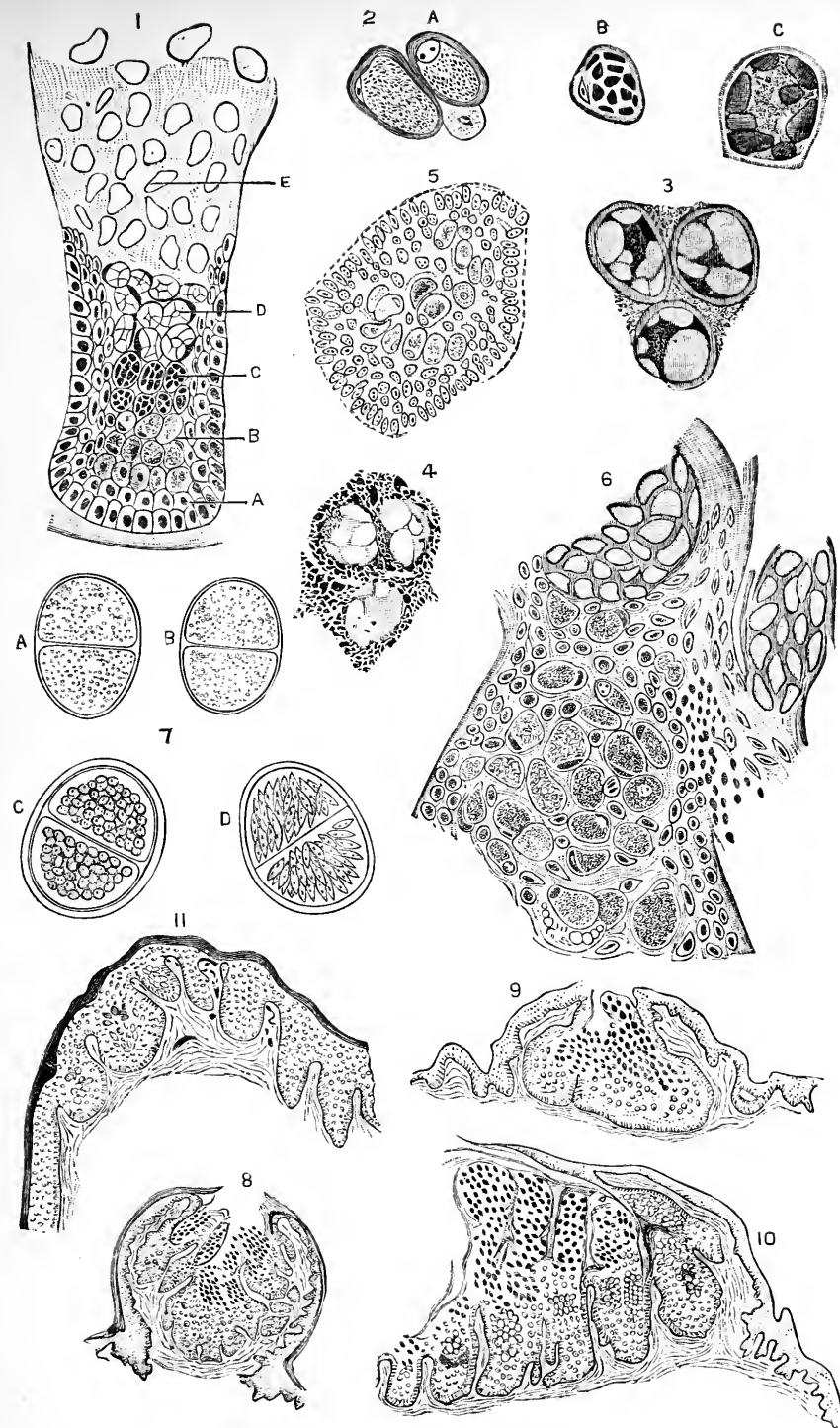
Alopecia Areata.—Of late years the parasitic theory of alopecia areata has come more prominently forward, and the Germans and Americans, who have generally favored the nervous origin of the disease, have become divided upon the subject. An admirable monograph by the great master of French dermatology, Ernest Besnier,¹¹⁷⁰ examines the question historically and critically. He describes briefly the various microscopic parasites which at one time or another have been found in or about the hair-follicles in alopecia areata, and notes the results of recent sections of the skin taken from typical cases. The latter show marked changes in the hair-follicle and atrophy or arrest of development in the hairs themselves, but nothing to throw new light on the subject. In this connection we may refer to the exhaustive monograph of A. R. Robinson, of New York,²⁸ who concludes that the organisms found about the hair-follicle act by producing atrophy by pressure, or something of that kind. The germs, whatever they are, are not "pilivorous," that is, they do not disintegrate the hair structure. Having pointed out that the adherents of the parasitic theory admit that the hair itself is not attacked by the parasite, and that the alopecia may, indeed, be caused by a trophoneurosis, but that this trophoneurosis is itself caused by parasites, Besnier goes on to show that alopecia areata is more closely allied to the tineas than to the true trophoneuroses. Proceeding to the consideration of the frequency of alopecia areata, Besnier says that in Lille, of five

thousand cases of skin disease, one hundred and forty-nine cases of alopecia areata were met with; in Lyons, of two thousand seven hundred and sixty-five cases, seventeen were alopecia areata; in Vienna, of five thousand cases, forty cases of alopecia areata; in Berlin, of one thousand and fifty cases, nine were alopecia areata; in another series of three thousand and eight cases, thirty were alopecia areata, etc. In America, as shown by the statistics of the American Dermatological Association, alopecia areata was found in seven hundred and ninety-four cases out of one hundred and twenty-three thousand seven hundred and forty-six.

The transmissibility of the disease is affirmed by Besnier, who cites epidemics in Paris and elsewhere, and who concludes his report to the Academy by suggesting a series of rules governing the management of cases found among children in the public schools.

Molluscum Epitheliale.—Under the name of “epithelioma (or molluscum) contagiosum,” Neisser⁴⁵_{July 31} gives an exhaustive review of the whole subject of so-called molluscum contagiosum. The points chiefly under discussion at the present time are: 1. As to the character of the new growth itself: Is the tumor an enlarged and correspondingly modified sebaceous gland, or a growth of epithelium? 2. Does the (now almost universally admitted) epithelial new growth arise from the epidermis, or from the epithelium of the excretory duct of the follicle, or root-sheath of the hair? 3. What is the significance of the molluscum corpuscles? 4. Is the disease contagious or not? Though he cannot as yet bring forward positive proof of his assertion, Neisser does not hesitate to express his belief that so-called molluscum contagiosum is in reality epithelioma contagiosum, and is caused by a parasite belonging to the class of *coccidia*. One of his theories is that the growth is a true epithelioma derived directly from the deeper layers of the rete Malpighii. On this point he is at issue with Kaposi, who believes that it is derived from the sebaceous glands. As regards the last two questions, Neisser considers the affection both parasitic (the molluscum corpuscles) and contagious. (See annexed plate.)

Comedo.—T. Colcott Fox⁶_{Apr. 7} alludes to the cases of comedo in children, reported by himself to the London Dermatological Society in 1883, by Mackenzie and others to the same Society in 1884, and by Crocker and Julius Cæsar in the *Lancet* for April



MOLLUSCUM EPITHELIALE.

1. Schematic representation of the various stages of epithelial change due to invasion of the parasite in molluscum epitheliale (contagiosum): A, normal epithelium; B, granular flakes appearing in the cells; C, the granular plates changing to bright, sharply-defined bodies (spores); D, the nucleus pressed against the cell-wall, and the defined bodies so pressed together as to look like a homogeneous mass divided by septa; E, the fully developed molluscum corpuscles. 2. Isolated cells more highly magnified. A corresponds to the cells in Fig. 1 (B); B, C, correspond to the cells in Fig. 1 (C). 3. Stained section of cells from Fig. 1 (D). 4. Cells from Fig. 1 (D and part of E), showing masses of eleidin and keratin between the cells. 5. Section of the lower part of an epithelial process affected by molluscum. 6. A large section showing affected and unaffected cells. 7. The urospores of Kölliker. 8, 9. Show the transition of rete epithelium into molluscum. 10. A large molluscum lesion in section showing the general progress of the disease. 11. A section of skin of the scalp showing the earliest beginning of the molluscum invasion. The glands are seen to be unaffected.

(*Vierteljahrsschrift für Dermatologie und Syphilis.*)

and June, 1884. He has since seen a number of cases, and summarizes the symptoms as follows: The comedones usually first make their appearance close to the hairy scalp over the centre of the eyebrows on each side of the forehead. They tend to group and form a patch in the centre of the forehead. In many cases they spread to the temples and thence progressively in a strip down the cheek in front of the ear, even to the angle of the jaw. Sometimes they extend over the scalp. They may occur elsewhere about the face and head. They tend to group. Sometimes acne lesions form. Occasionally several members of a family may have them. They usually occur between the fifth and the ninth years, but infants have been reported as affected. Dr. Fox has not been able to associate the condition with general ill health. He has never found the *demodex folliculorum*. Frictions with alkaline solutions, particularly soap and water, remove these comedones, which, indeed, tend to disappear spontaneously after a time.

Ephidroses of the Face.—Paul Raymond⁹⁴ gives a complete review of the subject with a report of two cases and an examination of the pathological lesions presented. Hyperidrosis of the face is unusual. Raymond has only been able to bring together sixty cases, many of which have been very imperfectly reported and few of which have been accompanied by pathological examinations. All, however, have been attributed to some abnormal condition of the nervous system and, in spite of their apparent want of resemblance, all can be grouped into a limited number of classes. He has in view particularly cases of unilateral sweating. In one group are to be included those hyperidroses which result from the severe pain of angina pectoris, nephritic or hepatic colic, strangulated hernia, etc. These may be localized in the face, but more frequently they are generalized. Under this head also should be included emotional sweats, herpetic sweats, the sweats of alcoholism, those following erysipelas or excitation of the nerves of taste, or, finally, those resulting from reflex central nervous lesions. Partial ephidroses of the face are more frequent than general ephidrosis. Sometimes they involve half the face, sometimes they are limited to the regions supplied by certain nerves; they may be localized even to an eyebrow. Finally, there are cases where an ephidrosis of the face, at first localized, shows a tendency to extend. It reaches the neck, the shoulder, the arm. It is to these forms that Raymond



Buck & McFadden, Lith.

Ephidroses Raymond, Archives de Neurologie

gives especially the name "unilateral perspiration." He purposely avoids the consideration of artificially produced facial ephidroses, as those reported by Strauss in 1879, who injected pilocarpine in cases of facial paralysis as an aid to diagnosis. Strauss found that in paralysis of peripheral origin there is a delay of one or two minutes in sudation of the affected side, the sweating also persisting a little longer, while in paralyzes of cerebral origin the function is the same on both sides. An analysis of the principal cases examined by Raymond shows that in one class there is an alteration of the cerebro-spinal nervous system. In one case a left-sided ephidrosis of the face coincided with left-sided hemiplegia. In three cases of general paralysis ephidrosis was observed. In an ataxic patient the painful crises were accompanied by abundant perspiration on the left side of the forehead. There were eye symptoms. A case has been reported where sweating of the right side of the head and shoulder followed cerebral congestion. Eating and emotion increased the flow and fourteen years later the affected parts were emaciated (or atrophied?) and the hair of the locality was white. In a child of six years attacks of epilepsy were accompanied by partial ephidrosis of the face. In an adult epileptic a similar ephidrosis existed, which was augmented by walking fast. In a case of one-sided sweating of the face of twenty years' duration the autopsy showed a concentric hyperostosis of the cranial bone and atrophy of part of the circumvolutions of the base of the brain. In a case of one-sided sweating of the face and neck without redness of the skin, pupillary involvement, or sensory changes, pressure near the spinous processes of the lower cervical vertebræ gave rise to pain.

Morselli, of Florence, in 1870, reported the case of a woman of fifty-five, who had suffered from paralysis of the right leg and right-sided headache, and who was admitted to the hospital in coma. The face was higher colored on the right side, the right eye was weeping, the pupils were irregularly dilated. Later the intense redness of the right side of the face extended to the conjunctiva, the neck, and the ear. The right side was swollen and running with sweat. The temperature was higher on the right side. The right eye was contracted and insensible to light. At the autopsy a glioma of the left hemisphere extending to the corpus striatum was observed. The cervical branch of the great sympa-

thetic was altered, and the superior cervical ganglion of the right side was notably hypertrophied. Under the microscope the nerve-cells were found pigmented, with fatty degeneration. The connective-tissue elements were hypertrophied. Thrombosis of the capillaries was also noted. In a second class of cases the lesion is more central, but it affects the cervical portion of the great sympathetic or near its first thoracic ganglion. Thus ephidrosis of the face has been observed in connection with aneurisms of the transverse aorta or of the brachiocephalic trunk. Weir Mitchell's case following a bullet-wound of the neck follows here, also the cases of ephidrosis in connection with exophthalmic goitre. Raymond's second case (the first was not followed by an autopsy) was that of a man of thirty-one, with pulmonary tuberculosis in the second period, with tubercular pleurisy of the right side. He suffered with excessive sweating on the right side of the head and face, but not extending to the neck. The sweating was constant and was unconnected with eating, emotion, etc. After several epileptic attacks the patient died. The lower cervical ganglion was found enlarged. Microscopic examination of this ganglion showed its fibrous element to be normal. The cellular tracts running from this tract to the centre were abnormally enlarged. A considerable infiltration of embryonal elements was found, in some places surrounding the nerve-cellules and the vessels without predominating. While the vessels were healthy, marked changes could be observed in the cellules. The nerve-fibres traversing the ganglion seemed perfectly sound. The condition may be summed up as abundant nuclear proliferation, compression of the cellules of the ganglion, with atrophy. In a third class of cases it is the nerves of the face which are involved. There is in these cases an irritation of the excito-sudoral nerves which accompany the facial and the trigeminal. Such are the cases of sweating observed in migraine and after operations on the parotid. A fourth class is where the ephidrosis is reflex. These cases occur in hysterical and nervous persons, and under this head is included the comparatively numerous class where eating, etc., excites sweating. A case has been reported where obstruction of the nasal passages, due to deviation of the septum, was accompanied by unilateral sweating, which disappeared after cauterization of the air-passage. Two types of ephidrosis may here be mentioned: (1) ephidrosis, myosis, vasomotor affections;

(2) ephidrosis alone, or more frequently associated with dilatation of the pupil. Ephidrosis, being a symptom, cannot usually be much improved by local measures. The continuous current to the spine, opium, bromide of potassium, and, above all, iodide of potassium, may be employed.

CHOREOBLASTOSES.

Lupus Vulgaris. — Jonathan Hutchinson, ^{Jan. 28} in his Harveian lectures on lupus, defines the disease as a serpiginous, infective, scar-leaving inflammation of the skin and mucous membrane. The distinctive features of lupus vulgaris are: (a) apple-jelly growth, usually present and characteristic; (b) non-symmetry the rule; (c) tendency to ulcerate; (d) common in children; (e) affects the two sexes almost equally; (f) not closely allied to chilblains; (g) very seldom fatal.

The principal forms of the disease are (a) *struma-lupus*, with subcutaneous abscesses and gland disease; (b) *common lupus*. Principal forms: (1) single patch; (2) multiple; (3) of hands and feet; (4) microgenic lupus; (5) of mucous membranes; (6) of septum nasi; (7) lupus mutilans; (8) lupus with elephantiasis.

In addition we have the rare forms of *acne-lupus*, *eczema-lupus*, *psoriasis-lupus*, *naevus-lupus* and *lupus lymphaticus*. I need not say that these terms have been coined by Mr. Hutchinson and will in all probability remain his own exclusive property. He asserts that these diseases are each two distinct affections



FIG. 1.—LUPUS MUTILANS.
(British Medical Journal.)

combined, and partake of the nature of both constituents. The pictures reproduced are characteristic of the most important forms. Of these (Fig. 1) lupus mutilans represents a form of the disease which begins in early life, involves the area around the fingers in ring form, and thus by contraction arrests growth. The most extraordinary deformity may result, the fingers being all lost or dwarfed until only their tips remain.

Lupus may attack the mucous membranes. The septum nasi may become involved and extensive destruction within and with-



FIG. 2.—SEVERELY ULCERATING LUPUS.
(*British Medical Journal*.)

out may supervene (Fig. 2). In some cases, where the affection attacks very young children, it may be very widely spread over the body. Beginning at a single point, other lesions develop on the hands and face; they become inflamed and rupia-like, and may give much trouble. The crust gets heaped up in large, conical masses resembling rupia. (See Fig. 3.)

In order to demonstrate the connection between lupus and xeroderma pigmentosum, or, to use Dr. Hutchinson's private desig-

nation, "Kaposi's disease," he gives a plate for purposes of comparison (Fig. 4, next page). Few dermatologists, however, will be found to admit any relationship between the diseases.

Leprosy.—Our Paris correspondent, Dr. de Pietra-Santa, writes that the question of the contagiousness or non-contagiousness of syphilis continues to excite much interest in the French Academy of Medicine, where it has again been brought up this year. (See



FIG. 3.—MULTIPLE LUPUS OF CHILDREN.
(*British Medical Journal.*)

ANNUAL of 1888.) Besnier having alluded to the doctrine of morbid spontaneity as "true medical fatalism," Le Roy de Méricourt retorted by designating as "medical romanticism" the doctrine of the latency of microbes, which permits them to remain dormant and incubating in lepers for ten, fifteen, or twenty years, calling this the period of somnolence of the germ. According to Besnier, leprosy comes only from the leper. "It is the human being who

carries in himself the germinal micro-organism of zymotic affections and even of malaria!" He admits, however, that the contagious and inoculable nature of leprosy has not yet been demonstrated, in spite of the discovery of the *lepra bacillus* by Hansen and

Neisser. However, after having asserted that leprosy, "thanks to modern bacteriological investigations, has entered upon the scientific period of its history," Besnier merely suggests that recourse should be had to methods of protection based on hygiene and general sociology, while remaining faithful to the principles of liberty and humanity which are the glory of our epoch. Hardy appears to our correspondent to have represented the opinion of the majority of the academicians in saying: "I do not believe that the question of the contagiousness or non-contagiousness of leprosy can at the present moment be definitely settled. I do not think that it is necessary to cry *careant consules*, and that the sanitary police are to be

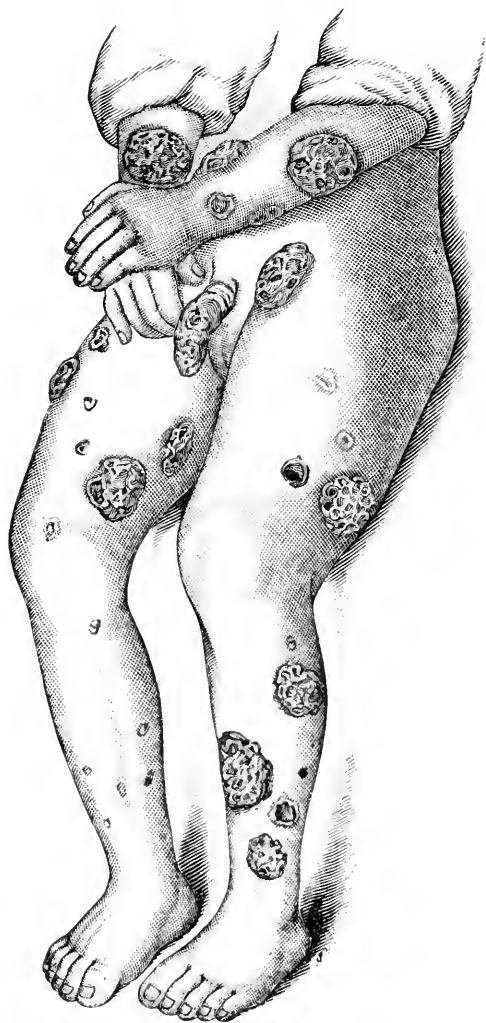


FIG. 4.—XERODERMA PIGMENTOSUM.
(*British Medical Journal*.)

brought in as well as hygienic measures." One of the most significant circumstances of this long discussion was Cornil's own profession of faith when called upon to respond to the question: "In what does the contagium consist in parasitic

diseases?" Cornil says: "Parasitism does not necessarily involve the idea of contagion, and it would be an error to believe that every bacterial parasitic disease can be transmitted from the affected individual to those who live with him. The latter must be in an especial condition of *receptivity* in order that contagion may occur. Knowing as little as we do regarding the habits and soil of the lepra bacillus, how can we pronounce positively on the method of introduction into the system?"

Beaven Rake, of Trinidad, collaborator of the ANNUAL, writes us that he has estimated the fibrin in the blood of fifty lepers, and has found the average percentage to be as follows: In seventeen tuberculous cases, 7.8 per cent.; in twenty anæsthetic, 7.9; in thirteen mixed, 7.2. The mean percentage of the fifty cases was 7.6. The range varied from 1.2 to 1.87 per cent., but in only two cases was the percentage below 2, that usually given for normal blood. Dr. Rake also reports one hundred cases of nerve stretching in lepra, and as a result concludes: 1. The great sciatic is the most satisfactory nerve to stretch, for it is near the spinal ganglion, and commands the supply of the whole leg and foot and the back of the thigh. 2. The chief indications for the operation are perforating ulcer; some cases of necrosis; pain, whether associated with the perforating ulcer or with peripheral neuritis. More or less relief was given in one-half the cases operated upon.

Our corresponding editor, F. R. Eklund, of Copenhagen, gives the statistics of Norwegian leprosy for some years past. The most interesting point stated is that two hundred and eighty-three lepers have emigrated during the past thirty years, of whom most have come to the United States!

Syphilitic Alopecia.—Fournier, ⁵⁵_{no. 5} in a clinical lecture on this subject, says that syphilitic alopecia is met with in both sexes and at all ages, but is more frequent among women. It is common. Diday observed it fifty-three times in sixty cases. *It does not result in baldness.* It may easily be cured by treatment; in fact, it may be prevented. It is rarely so marked as to call the attention of others than the patient to its existence. It is more frequent and more marked in the asthenic forms of syphilis, complicated by general want of nutrition, fever, or anæmia. In Fournier's opinion, syphilitic alopecia is a direct result of syphilis, not of want of nutrition due to syphilis. It may occur in syphilitics who appear

otherwise to enjoy robust and flourishing health. It appears from the third to the sixteenth month of the disease, rarely later. In the "tertiary" stage, alopecia may occur as a result of gummatous ulceration of the scalp or of cachexia. It may affect any or all parts of the scalp indiscriminately. It differs from senile alopecia in being often asymmetric. It may operate in a general thinning of the scalp or in areas, the latter not resembling those of alopecia areata. In syphilitic alopecia and even when alopecia does not exist the hairs become dry and lustreless.

Syphilitic alopecia is transient, lasting no more than five or six months at most, after which the fallen hair is completely replaced. Other localities than the scalp may be affected. The beard is often decimated. The eyelashes may fall, and in women especially the eyebrows, in patches. The syphilitic eyebrow is a tell-tale, says Fournier. It is a scanty, ragged eyebrow. The hairs which in the normal brow are smooth, regular, and all pointed the same way, are in syphilis lustreless, dry, ragged-looking, and divergent. There are eyebrows normally poor in hairs, but here we usually have a certain amount of redness and scalliness. The eyebrow of alopecia areata is usually accompanied by characteristic patches on the face and scalp. Besides, alopecia areata makes a clean sweep; no hairs exist within the affected area. Ciliary alopecia is common. It is usually partial and incomplete. Alopecia of the genitals is commoner among syphilitic women, and in some cases falling of the hair from the axilla, abdomen, etc., is observed. The treatment of the affection is chiefly internal, and Fournier prefers mercury given in the same manner as for the other general symptoms of syphilis. The scalp should be kept clean and gently brushed and combed.

Our corresponding editor, Pietra Santa, of Paris, gives some additional information regarding the question of contagion in alopecia under the title of *La Pelade à l'école*. Ollivier has frequently maintained, before the Academy of Medicine, in Paris, the non-contagiousness of alopecia areata, insisting that the rules governing the admission of affected children to the schools should be revised. His views are those until recently very generally current in this country, namely, that alopecia is a trophoneurosis due to recent perturbations of the nervous system, severe labor, violent emotions, quarrels, wounds, convulsions, etc. The parti-

sans of the duality of *la Pelade* (Brocq, Vidal, and Hardy) assert that it is impossible to make a differential diagnosis between the parasitic contagious form of the disease and the nervous trouble. Hence the danger of allowing the "*peladeux*" in public schools and the necessity of a frequent and minute examination of the children's heads.

After long discussions and reference of the subject to a committee, the Academy has formulated certain rules providing that under the supervision and inspection of specialists certain *peladeux* may be allowed, with precautions of treatment and isolation, to remain in the schools.

The hygienic measures proposed by the Academy on the report of Besnier are as follow: 1. No individual affected by pelade can exact admission to retention in a public establishment, a school, a military company, or an office as a right. The question must be submitted to medical decision. 2. In case of admission, healthy persons must be protected from all contact, mediate or immediate, with the diseased localities, which, in addition to medical treatment, must always remain covered to diminish the chances of contagion. The hair and beard are to be kept short, and washed with warm water night and morning. 3. Each case is to be studied, especially from the point of view of its origin. Admission should be more readily granted, if the case is of old standing and nearly cured, than if recent and spreading. 4. In "maternal" and infant schools, exclusion, being of less importance, should be rigidly enforced. 5. In primary schools admission may be permitted, the patient being kept apart during class and recreation, and the head kept covered. 6. In military establishments the same precautions are to be taken. All hair-dressing implements are to be sedulously burned.

A recent circular of the Minister of Public Education puts these regulations in force in all schools, etc.

Fibroma Molluscum.—Our Tokio, Japan, corresponding editor, Dr. Whitney, mentions a case of Hashimoto's, ²⁰⁰_{p.197} of a Japanese farmer, forty-two years of age, who presented a number of tumors of various size and shape, in various parts of the body, some of strange shape and enormous size. His father and elder sister had suffered from the same condition. In childhood a few tumors had appeared, and with his growth new ones constantly

made their appearance to the date of his examination. The larger ones had appeared suddenly about three years previously. When seen by Dr. Hashimoto, the patient was weak, emaciated, and anæmic. He could not walk or even rise, from weakness and the weight of the tumors. The skin of the whole body was of a gray color and covered all over with growths of various size, closely set together. There was also localized hypertrichosis. The smallest of the tumors were almost microscopic, averaging for the most part the size of a pea or bean. The largest was not less than thirty-one inches in circumference. The growths varied in shape and appearance. Some were sessile, others pedunculated, mushroom-like, or purse-shaped. Three were particularly large. One sprang from a small attachment over the ninth dorsal to the third lumbar vertebra on the right side of the spinal column and hung down, like a rather flaccid bag. It was about nine inches in diameter. The second grew along the inner surface of the left arm with a wide base, and hung down in flask-shaped, flattened masses, divided into three portions (see plate). The third of the large tumors sprang from the front surface of the left forearm like a small bag. Its greatest diameter was eight inches. The surface of the tumor was smooth and the skin, for the most part, not markedly changed, but in places there were patches of hypertrichosis. The tumors were all soft and elastic, the larger ones seeming to have harder nodules imbedded in their substance. There was hardly any portion of the body free from the growths, of which four thousand five hundred and three were counted in all. Sensation of all kinds was more or less blunted over the tumors. The patient had some emphysema of lungs with weak pulse. He seemed rather dull.

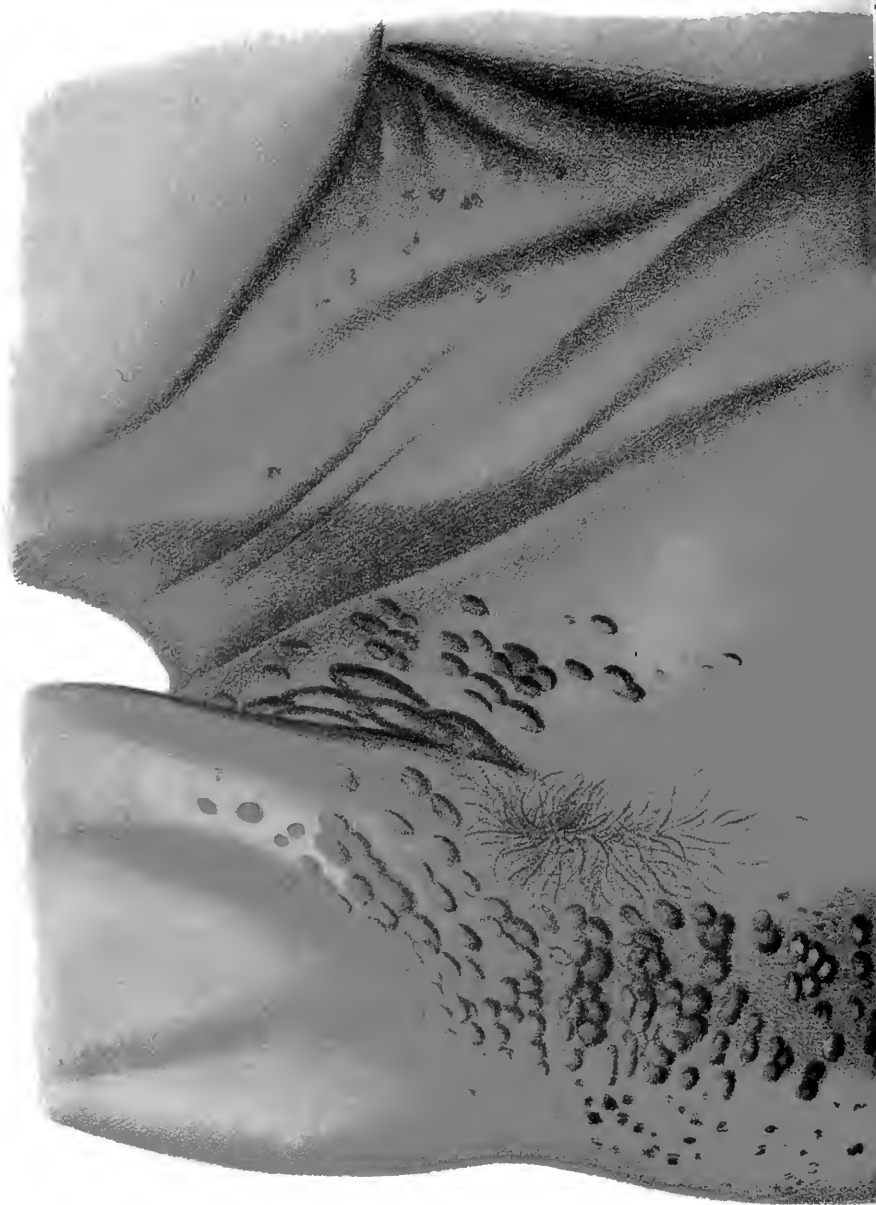
Xanthoma.—Under the title “Xanthoma Multiplex developed from Vasculo-Pigmentary Nævus,” H. Köbner, of Berlin,⁴⁵
June 25 describes the case of a man of twenty-seven who presented a peculiar skin eruption beginning in his second year. The lesions were at first red spots on the axillæ, extending thence on one side down the front and back of the thorax, and scattered as far as the knee, and on the other side down the arm to the elbow. In the patient’s twelfth year a similar eruption appeared upon the neck. Between his fourteenth and sixteenth years the lesions about the axillæ began to rise above the surface, while in other localities they dis-

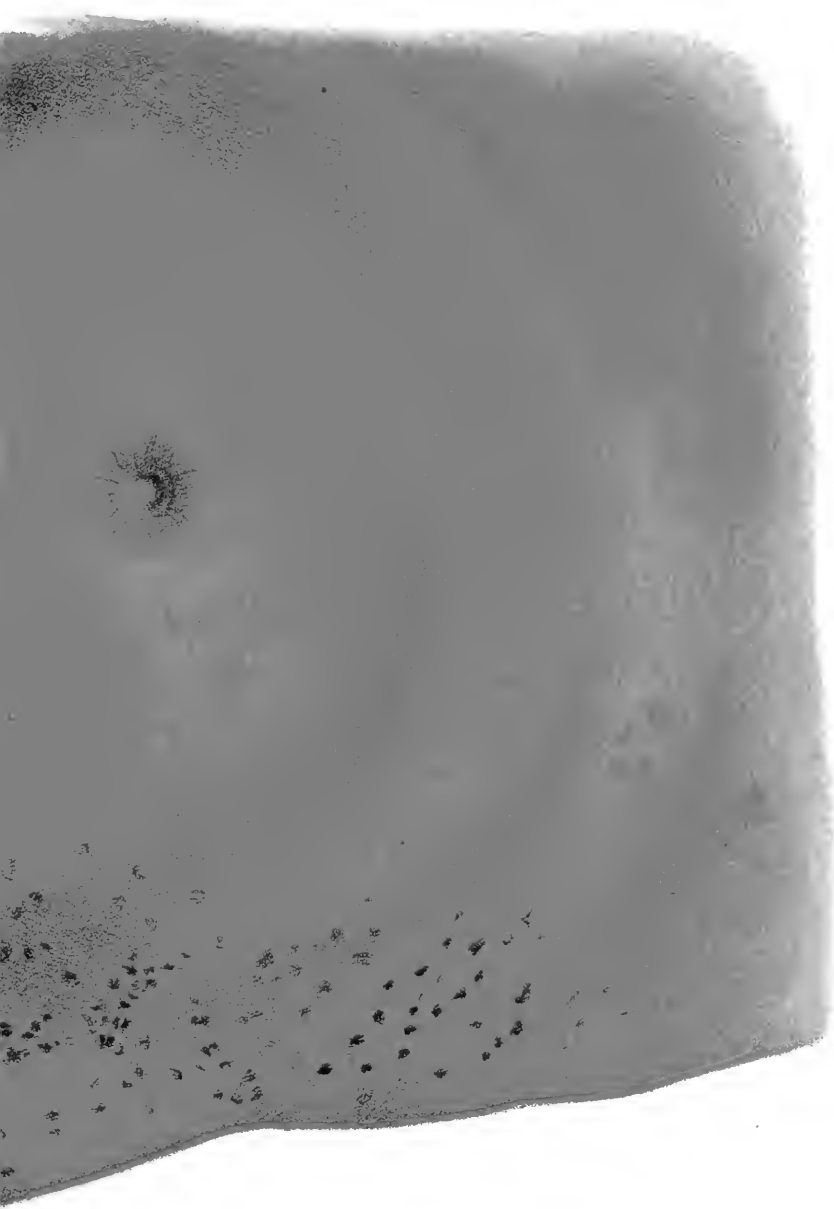


Fibroma Molluscum (Hashimoto).
Sei-Ikwai Medical Journal, Tokio.



Fibroma Molluscum (Hashimoto)
Sei-Ikwaï Medical Journal, Tokio.

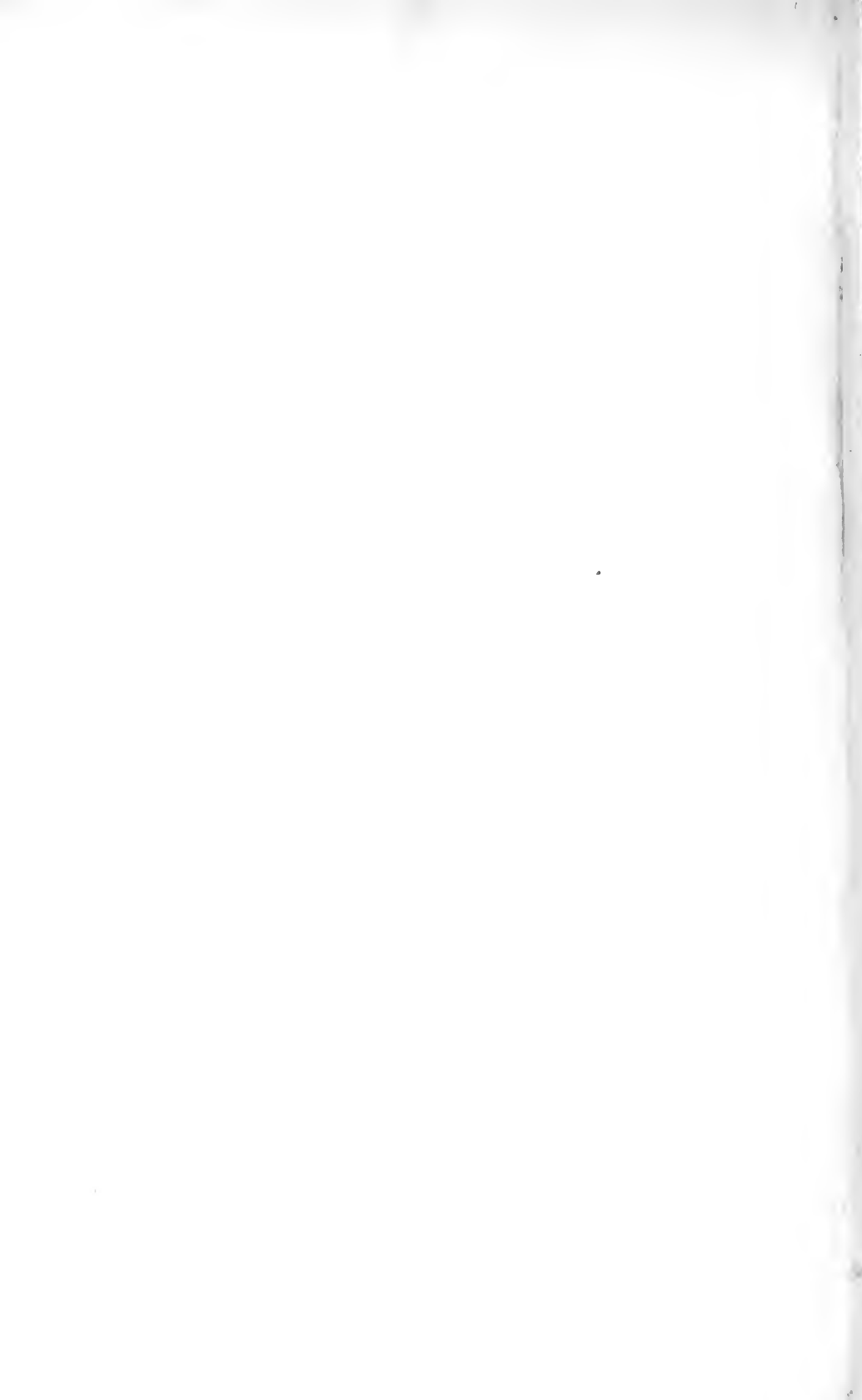




Nautiloma multiplex (Pilsbry, 1900)

Nautiloma multiplex (Pilsbry, 1900)

Nautiloma multiplex (Pilsbry, 1900)



appeared. The lesions never gave rise to any abnormal sensations. When examined by Köbner, in March, 1877, the anterior and posterior axillary folds on the right side showed a great number of small tumors of a brownish-red to violet color, sprinkled over with yellow elevations which spread about the neighboring parts more sparsely, and were merely macular about the peripheral portions of the patch. Some of these coalesced into larger patches. (See colored plate.) There were also some scattered yellowish tumors elsewhere, and some reddish macular patches. No xanthomatous growths could be observed on the eyelids, and the gums, lips, and mucous membrane of the mouth were normal. Liver and spleen were normal. The urine was free from sugar and bile pigment. The patient had never had jaundice. Microscopic examination showed that in spite of the peculiar color the lesions were xanthomatous. Their appearance, however, was peculiar, and, so far as Köbner knows, hitherto undescribed. The peculiar locality of the tumors, their absence from the usual seats of xanthoma, their massing together, and their peculiar red color, all seemed very unusual, as also their regular order of arrangement in the line of nerve distribution and the presence of angioma-like lesions. The microscopic examination of the various lesions demonstrated the truth of the hypothesis which attributes the origin of xanthoma to the plasma or connective-tissue cells of the embryonal period. These have a strong tendency to fill up with oil-globules, without, however, becoming true oil-cells, and are easily connected with pigmentary nævi. At this point Köbner cites Hardaway's and other similar cases, and likens his case to those of vasomotor and trophic nerve nævi," which have been reported. Köbner describes his case at great length and also gives an account of a similar one.

THERAPEUTICS.

Balsam of Peru in Leukoplakia.—Rosenberger ³⁴_{Oct. 30} recommends painting the patches with a brush dipped in pure balsam of Peru, and retaining it in the mouth for three to five minutes. There is a slight burning at first, with abundant salivation. The procedure should be carried out thrice daily. In thirteen cases observed much relief was thus obtained. Those opaline, white, thick patches, occasionally found on the tongue and on the buccal mucous membrane, are, as is known, exceedingly rebellious to treatment, and

tend to epitheliomatous degeneration. This treatment, therefore, is worth trial, although it is slow; an average of a year is required to heal the patches.

Persian Insect Powder in Pediculosis Pubis, P. Vestimentorum, and P. Capillitii.—A writer²⁷¹_{Mar.} recommends the powdered flowers of the *pyrethrum*, *carneum*, or *roseum* for the destruction of head and crab lice. The parts affected should be wiped perfectly dry and a small quantity of the powder dusted over the part and rubbed in thoroughly. In two minutes every louse coming in contact with the powder will be dead. In clothes or body lice the powder should be blown by a powder blower upon all the underclothing. As the nits are not destroyed, the operation must be repeated at intervals of two or three weeks. (Vinegar or acetic acid [dilute] will destroy the nits).

Treatment of Sycosis.—Sycosis is treated by Unna²⁸_{Mar., Apr.} as *hyphogenous* or parasitic and *coccogenous* or simple sycosis. In non-parasitic sycosis he regards shaving as very important. It should be followed by the constant application of carbolic-mercurial or resorcin plaster-muslin; or if the patient will submit to nocturnal treatment only, a zinc-sulphur salve-muslin is to be worn at night, followed in the morning by epilation of the pustules, washing of the part, and the application of a 5 per cent. alcoholic solution of resorcin to each affected follicle. Sulphur, ichthyol, resorcin, pyrogallol, and chrysarobin, in 2 to 5 per cent. ointments, or ichthyol in a 10 per cent. emulsion, may be applied at night. If the beard cannot be shaved, it will be harder to cure the disease. In this case depilation is to be performed in the case of every hair showing a pustule around its base, the suppurating follicle is to be washed out, and a zinc-sulphur or a weak resorcin-sublimate ointment is then applied. The rhinitis, which is often present in connection with sycosis of the upper lip, is to be treated by nasal douches of a 1 per cent. solution of ichthyol. For some time after the disease seems well the face should be shaved with sublimate soap, each hair that is suppurating should be plucked, and the follicle touched with alcoholic solution of resorcin (strength not given), and the face should be anointed with a resorcin or sublimate ointment or paste.

In *parasitic sycosis*, Unna recommends, after shaving, the use of the following ointment:—



Leukopathia unguium. No. 1507

R	Hydrarg. bichlor.,	. . .	gr. $\frac{1}{2}$	(0.032 gramme).
	Pulv. resorcini,	. . .	ʒ 1	(1.30 grammes).
	Ung. simplicis,	. . .	ʒ 3 ʒ 1	(13. grammes).

In milder cases he employs the following formula in the form of a spray:—

R	Hydrarg. bichlor.,	. . .	gr. $\frac{1}{10}$	(0.0065 gramme).
	Pulv. resorcini,	. . .	gr. 50	(3.24 grammes).
	Aq. cologniensis,			
	Alcoholis,	. . .	āā f ʒ 1	(31. grammes).
	Ol. ricini,	. . .	℥ 10	(0.65 gramme).

The Hypodermic Administration of Arsenic.—Besnier,³⁵ in a clinical lecture, says that in severe cases of lichen ruber planus, and also in sarcoma and “polyadenopathies,” or general glandular enlargements, subcutaneous, or rather intramuscular, injections are valuable. Bad results do not follow if antiseptic precautions are taken. The Fowler’s solution should be boiled and the point at which the injection is to be made should be sedulously cleaned. After the injection the wound should be closed by collodion. The dosage is a matter of some difficulty, as such different idiosyncrasies exist in different persons. In some persons two drops of Fowler’s solution cause palpitations. It is better, therefore, to begin with one drop of the arsenical solution in fifteen minims (one gramme) of distilled water. If this is well borne, the dose can be increased gradually to six drops, the maximum.

In *acne* Isaac recommends the following:—

R	Resorcin,	. . .	2½ to 5 parts.
	Oxide of zinc,		
	Starch,	. . .	āā 5 parts.
	Vaseline,	. . .	12½ parts.—M.

This paste may remain on a day and a night and may then be removed with a piece of cotton. The cure is said to be speedy, occurring in three to five days.

MISCELLANEOUS.

Dermatitis.—Our corresponding editor, Dr. Diakonoff, of Moscow, Russia, gives a brief *résumé* of the recent St. Petersburg thesis of Kriloff on “The Causes of Acute Suppuration.” Kriloff employed innunctions upon various animals with the following ointment: tartar emetic, one part; lard, four parts. The ointment was sometimes sterilized and sometimes not, and he found that pustulation was only induced in those cases where the ointment

was not sterilized. Microscopic examination of the pustules showed the presence of staphylococcus pyogenes, which Kriloff regards as the principal cause of all suppuration.

Factitious Eruption. — Pierrepont⁸¹_{Sept.} gives the following very curious case: A white woman, twenty-two years of age, unmarried, was in the hospital for some months under treatment for a sprained ankle, for which counter-irritation by fly-blisters had been used. One day the patient was informed that she could take her discharge next day. That night she had a "breaking-out" on the left forearm from the elbow to the wrist. On examination the arm was found covered with large bullæ closely resembling those of pemphigus. After letting out the serum, a soothing application was used which caused the raw surface to heal in about a week. When she was again told she would be discharged, a similar eruption broke out on the right arm. The blebs were like those which would be produced by a fly-blister, some of them measuring two or three inches in length. No remedies succeeded and the patient remained under treatment by several successive physicians without much change in the eruption, excepting that the legs from the knees to the ankle were subsequently involved. After some months a last and severe attack was relieved and once more the patient was about to be discharged, when the physician was called in great haste to the patient, who was said to be dying. Upon reaching her bedside she was found to be in profound coma; pupils normal but insensible to light; respiration very shallow and jerky; radial pulse, barely perceptible and dichrotic; surface cold and clammy, and covered with large drops of perspiration; prolabia cyanosed.

Nitrite of amyl, whisky hypodermically, hot-bottles, etc., were employed, but the patient remained unconscious from six in the evening to five o'clock next morning. As the patient was supposed to be dying, her effects were opened, when a fly-blister was found about a foot wide by two feet long. The patient subsequently confessed the fraud and also admitted having taken surreptitiously the day before a mixture of bromide of potassium, hydrate of chloral, fluid extract of gelseminum, and tincture of hyoscyamus. The quantity taken was about five times the maximum dose.

At the time of each outbreak of the eruption the patient complained of pains in the kidneys, probably genuine and caused by

the blister. Her urine also was pink in color and contained a mysterious sediment, which was subsequently found to be face powder placed in the chamber. The eruption, it should be remarked, always came out at night.

Furuncle.—Uma, ²⁸_{No.3} in threatening post-eczematous furunculosis, adds carbolic acid or thymol to the ointments being used, or replaces the lead or zinc pastes by resorcin or sulphur ones respectively. Most sure of all is the addition of one or two parts of sublimate per thousand of zinc ointment, aided by the internal administration of calcium sulphide.

Erythrasma.—This name, says Payne, ⁴¹⁸ is applied to reddish-brown scaly patches found on the inner surface of the thigh where the scrotum is in contact with it, and on the corresponding surface of the scrotum. A similar condition, probably due to the same cause, may occur upon the groin. The affection looks at first sight like an intertrigo or mild eczema, but there is no inflammation and a fungus of some kind is always a feature of the condition and probably its cause. Several vegetable forms are seen. Dr. Payne has found some cells of a species of torula, or sacchyromyces. The form resembles but is larger than that found in pityriasis of the scalp. Again, there are seen peculiar threads like the mycelium of a small, round fungus. This was originally described by Burchardt as the cause of the disease, under the name *microsporon minutissimum*, but Payne has failed to find spores in it. He is uncertain about its botanical nature as yet, but thinks it most resembles "involution forms" of bacilli, as the cholera fungus. In a single instance Payne found small numbers of large threads, like tricophyton. He concludes that although these appearances hardly constitute a disease, the brown and scaly condition of the skin is due to the growth of parasitic organisms, or epiphytes, which find a suitable nidus in the warm and moist skin of the part in question. (Sulphurous acid would probably be the best remedy in these cases.)

Chancroid.—Our collaborator, Dr. Petersen, of St. Petersburg, sends us a brief note of a treatment of chancroid which he has employed successfully for a year past. He washes the ulcer with a one to four thousand solution of corrosive sublimate, and then scrapes it out with the sharp spoon. Three hundred cases have been treated in this way with excellent results. The ulcer is

transformed from an infectious to a clean sore, which heals up rapidly.

HEREDITARY SYPHILIS.

Extensive Symmetrical Deformity Resulting from Hereditary Syphilis.—Smirnoff²⁸_{Jan. 1} gives the case of a man of twenty-three brought up in a poorhouse, who was well and strong up to his ninth year, when he began to display certain deformities without other symptoms of disease. About his nineteenth or twentieth year ulcers slowly formed in his hard palate, and the destructive process went slowly on until, at the time of his examination, the hard and soft palates, the septum narium, and the incisor portion of the upper jaw showed extensive loss of tissue with ulcerative borders resembling syphilitic ulcers. No other symptom of syphilitic disease was present, nor any of scrofula. No rheumatism nor history of any, but the great toes of both feet were strongly curved outward and for the most part covered by the second toes, the joint of the great toe with the foot pushing strongly forward. The four fingers of each hand, from the second on, could not be straightened out, even with force, because the first and second phalanges, apparently from ankylosis, and not from contraction, were bent at an angle. The terminal phalanges of both fingers and toes were extraordinarily broadened and flattened out, with large, broad nails on the fingers. The elbow, wrist, foot, and knee-joints were markedly deformed, particularly the last three. The other bones, as of face, etc., were all more or less deformed. The various organs seemed healthy.

Smirnoff gives various measurements, of which we need only note the length of the body, one hundred and sixty-seven centimetres, or about four feet nine inches; in other words, that of a dwarf. The patient was put upon mercurial and afterward upon mixed treatment, under which the ulcers healed, but no change occurred in the condition of the bones. Smirnoff gives his reasons for excluding rheumatism and gout, and gives the notes of a somewhat similar case going to indicate inherited syphilis as the cause of the trouble.

Late Hereditary Syphilis.—Under the name "*syphilis hereditaire tardive*," Morel-Lavallée¹⁷_{May 3} says that two orders of cases are included: 1. Those in which syphilis, latent or unrecognized through long years, suddenly reveals itself in an organism, healthy, or up to

that time believed to be so (*e.g.*, the appearance of a gummatous syphiloma of the pharynx in a patient of sixteen or eighteen years, who up to that time has been free from disease or only scrofulous). 2. Those where the disease, having displayed the usual symptoms during early life, spares the existence of its victim, but pursues him, at variable intervals, with various manifestations of "tertiarism" up to adolescence, or even later. He then gives notes of a case coming under Fournier's care, where a patient, experiencing during the first few months of life the first attacks of syphilis, had suffered from repetitions of the same up to the age of thirteen years without being entirely free. The history of the patient could be summarized as follows: One to three years—athreptic diarrhœa (atrophy of the testicles); fourth year—double iritis, synechia, beginning of interstitial keratitis; fifth to ninth year—anginas, cervical adenitis; tenth to eleventh year—multiple gummata of the palate, nasal and intranasal osteitis, ozæna; thirteenth year—multiple exostoses, pseudo white swelling of elbow. The last lesion deserves a moment's notice. It resembles closely the tuberculous or blenorrhagic white swelling (sometimes, in fact, the affections cannot be distinguished by any objective symptoms. But syphilis rarely attacks both juxta-articular epiphyses *at the same time*). It constitutes one of the most interesting varieties of specific arthropathies. It respects the rule according to which the syphiloses of the bones spare the synovials and only attack the joints secondarily: (*a*) when the articulation becomes suffused as a result of specific epiphyseal congestion; (*b*) when the joint is attacked by functional impotence resulting from deformities of the peripheral parts—usually osseous.

As is commonly observed in the specific arthropathies, or, rather, the juxta-articular osteopathies, an osseous extremity is attacked to a preponderating or exclusive degree, the tibia rather than the femur, the ulna rather than the humerus. A similar case has recently been reported from Fournier's clinic, from which Lavallée concludes that exostoses may show themselves at any period of syphilis, and in a number of places as relapses in the same individual. Pain is a variable symptom in these cases. In one slight case it may be insupportable; in another, much more severe, to all appearance it may be absent. Treatment relieves pain and diminishes the size of the exostosis, but does not necessarily remove

the consequences of the disease entirely. These articular troubles do not yield entirely to treatment; mysterious cracklings in the joints, etc., are often observed later. But treatment should always be actively employed, for in some cases dire results have followed its omission.

First Symptoms of Hereditary Syphilis.—N. H. Miller,⁷⁷ July 15 in a clinical lecture on this subject, says that a characteristic peculiarity of hereditary syphilis is the polymorphism of its cutaneous eruptions. Among one thousand cases of hereditary syphilis the different morbid symptoms were distributed as follows:—

Papules and mucous papules,	74 per cent.
Rhagades of the lips and anus,	70 “
Rhinitis,	58 “
Ulcers of the hard palate,	52 “
Erythematous eruptions,	45 “
Lymphadenitis chronica,	20 “
Ulcers of the tongue (glossitis ulcerosa),	27 “
Bullous eruptions (“pemphigus”),	25 “
Onychia and paronychia,	23 “
Laryngitis,	17 “
Pseudo-paralysis of the extremities,	7 “
Ulcers,	4 “
Ulcerative gingivitis,	4 “

In the great majority of cases the children with hereditary syphilis were excessively emaciated and atrophic, of less than normal weight, and in many cases immature. Miller suspects all children of incomplete gestation and presenting congenital debility of being syphilitic, and thinks they should not be nursed by a stranger during the first few months of life, until observation shows if there be any syphilitic disease. The physiological process of separation of the umbilical cord is delayed in the premature cases to the second and third week, and predisposes to inflammation and septic infiltration. According to the statistics of writers on this subject, hereditary syphilis usually manifests itself in the first month of extrauterine life, less frequently in the second month, and least frequently in the third month. Later than that post-partum infection may be suspected.

THE THERAPEUTICS OF SYPHILIS.

We cannot begin our review of this subject better than by referring to the excellent monograph of Schwimmer,¹¹⁷¹ who proposes for consideration the following questions⁵⁷ Aug. 5:—

1. What means will best preserve the organism from the outbreak of syphilis?

2. What means will most satisfactorily combat the already present attack of syphilis?

3. At what period can we say in any given case that syphilis has disappeared?

Schwimmer treats all these questions at some length and terminates by a number of conclusions which we shall briefly recount: Syphilis, being a chronic disease, requires a protracted treatment. Mercurial treatment should be undertaken as early as possible—where the initial symptoms are severe, so soon as their character is ascertained; in lighter cases later, but always before the appearance of general skin and mucous membrane symptoms. Mercurials should be used in the earlier periods at least two or three months, and should then be followed by a two months' course of the iodides. After four or five months of unbroken treatment, a pause of two or three months may be taken. Any local symptoms, on skin, mouth, etc., which may appear during this period may be treated locally. When relapses of any moment occur, the original treatment is gone through with once more, only lasting three months instead of five. If, however, no relapse occurs during the first six months of the treatment, the second period of treatment is to be reckoned from the eighth to tenth month after the recognition of the disease. The treatment by decoctions is most useful in affections of the parenchymatous organs, without regard to the date of the disease. If, after twice repeated thorough courses of mercury and iodine, further relapses occur, this method of treatment may be properly brought into use. The watering-place treatment may be employed only after relapses have taken place under specific treatment, and, even then, if serious symptoms arise, recourse must be had to mercury and iodine. The hydropathic treatment is a useful succedaneum. It is tonic and invigorating, but should only follow the thermal treatment after an interval of several months. If, in spite of carefully followed treatment, the syphilitic symptoms are prolonged into the second year, a two to three months' course of mixed treatment may be pursued. If marriage is in question, a still longer period should be covered. An eighteen to twenty-four months' treatment, with appropriate intervals, will usually give a favorable result. A guide to this result will be the

non-appearance of symptoms for twelve months previous. In carelessly treated, aged, or constitutionally depraved persons the prognosis is less favorable.

The Chinese Treatment.—Our corresponding editor, Robert Coltman, of China, tells us that a curious but effectual form of treatment for syphilis, employed by the native physicians, consists in taking an ounce of native calomel (which varies much in strength), and, after having plucked and drawn a cock, rubbing the mercurial into the chest. The fowl is then put into a covered iron kettle, covered with water, and boiled until the flesh drops from the bones. These are removed, and the patient takes the gelatinous meat and soup, eating *ad libitum* until finished, which sometimes takes three days. This causes profuse diarrhœa, but, so far as Dr. Coltman knows, no salivation. He adds that the Chinese believe that mercury causes impotence. The literati decline to take it in any form.

Calomel Injections.—Our corresponding editor, Dr. Nicolich, of Trieste, Austria, tells us he has used hypodermic injections in his hospital practice for two years past in the treatment of syphilis. He employs a dose of 0.10 gramme (1.6 grains) of calomel mixed with boiled almond-oil, to be repeated every seven days. Four injections suffice to cure a case of medium severity. The injections are made in the gluteal muscles to avoid abscesses.

Yellow Oxide of Mercury and Calomel Injections Compared.—Kühn^{69 9}_{p.635; Sept.15} says that the formation of abscesses is entirely obviated by suspending calomel in oil. He has compared the action of calomel with that of the yellow oxide, and thinks the former the better. Four to six injections of calomel have the same effect as six to ten of the yellow oxide. The following suspensions were used: Calomel, by vapor, fifteen grains (one gramme); best olive-oil, half an ounce (15.55 grammes); or yellow oxide of mercury in the same proportions. (I suppose fifteen minims [one gramme] of the suspension were injected at one time.) The yellow oxide gave the most pain and the greatest induration.

Alaninate of Mercury in Syphilis.—De Lucca⁵⁷_{Apr.15} says that alaninate of mercury is well borne by patients, whether given internally or hypodermically. By the latter method it is preferable to all other soluble mercurials, because of its rapid action, the small dose required, and the infrequent occurrence of abscesses. On an

average 0.005 gramme (about one-twelfth of a grain) of the salt dissolved in fifteen minims (one gramme) of water were injected daily. In infantile syphilis, 0.002 to 0.005 gramme (one thirty-second to one-twelfth grain) were given by the mouth and agreed better than other mercurials. De Lucca thinks the cures in these cases are more permanent than usual. What alanin is he does not tell us, but one part is dissolved in twenty parts of distilled water, gradually brought to a boil, and then powdered binocide of mercury is slowly dropped in until it ceases to dissolve. After filtration and partial evaporation the solution is set aside, and the salt crystallizes out.

Salicylate of Mercury in the Treatment of Syphilis.—Salicylate of mercury is one of the newer remedies in syphilis which has attracted considerable attention during the past year. Bruno-Chaves, of Rio Janeiro, ²⁸⁷_{Apr. 25} says that Lajoux and Grandval, of Rheims, first studied in 1881 the various chemical combinations of salicylic acid with mercury. The physiological action of the drug was examined by Duprat, a Brazilian student in Paris, but the distinguished Professor Silva de Araujo was the first, in July, 1886, to introduce the drug into medical use. He was led to experiment with it by reading Gamberini's article on phenate of mercury, and by the idea that by uniting two parasiticide remedies in one better results could be obtained. The drug has been taken up by Brazilian specialists and used especially in the eye troubles of syphilis, but also in other forms of the disease. The dose in pill form is 0.025 to 0.075 gramme (two-fifths to one and one-fifth grains). The pills should be coated. Externally in the form of an ointment of the strength of eight to thirty grains (0.52 to 2 grammes) to the ounce (thirty-one grammes) of vaseline, salicylate of mercury has a "marvelous" effect. Hypodermically it has been used in the dose of 0.005 to 0.010 gramme (*i.e.*, one-twelfth to one-sixth grain) dissolved in about two and a half fluidrachms (7.78 to 9.72 grammes) of distilled water. The salicylate does not irritate the digestive organs nor does it cause stomatitis. In addition to the brilliant results which this salt has given in rebellious syphilis, it has proved highly useful in parasitic skin diseases and in connection with chaulmugra oil in lepra.

Action of Mercury on the Human Organism.—Rémond, ²⁸⁷_{Mar. 25} desiring to repeat the experiments of Müller on the absorption

of mercury by the lungs, and to study at the same time what variations occur in the urinary excretion during a mercurial course, selected two syphilitic patients, one to be treated by mercurial vapors and the others by inunctions. The first patient was placed in a cabinet of fifty cubic metres capacity and submitted to the constant inhalation of mercurial vapor derived from measured quantities of mercury with chalk. Nine grammes (one hundred and thirty-nine grains) per day of mercury were volatilized in the chamber. On the seventh day the patient was placed in the chamber. Nearly three milligrammes (one-twentieth grain) of mercury were eliminated that day by the urine. The patient remained thirteen days in the chamber and the daily elimination of mercury gradually rose to seven or eight milligrammes (one-eighth to one-tenth grain). The day after his release from the chamber it fell to about six milligrammes (one-eleventh grain).

The second patient was placed upon mercurial inunctions. It was three days before mercury began to appear in the urine, and it gradually reached the amount of six milligrammes (one-eleventh grain), but rapidly fell off when the frictions were stopped. Rémond concludes that both lungs and skin are independent routes for the absorption of mercury, but the former is the quicker. Mercury is eliminated in gradually increasing quantities, but the elimination rapidly falls to what seems to be the residual dose. The elimination of phosphates and chlorides does not seem to be influenced by the administration of mercury, but the excretion of urea is diminished.

The Abortive Treatment of Syphilis.—Fournier¹⁰⁰_{Oct. 9} says that four guarantees are indispensable to establish the reliability of a reported cure by this procedure: 1. Confrontation of the man and the woman. 2. An incubation, clear and exact, of three or four weeks at least. 3. A complete and logical observation demonstrating that the excised lesion was certainly a syphilitic chancre and that the patient has not subsequently suffered from the generalized disease. 4. An assiduous and prolonged surveillance of the patient during six months at least. Fournier is inclined to think that the observations hitherto published are deficient in one or another of these points, and therefore throws them out as inconclusive.

OPHTHALMOLOGY.

By CHARLES A. OLIVER, M.D.,

AND

GEORGE M. GOULD, M.D.,

PHILADELPHIA.

SECTION I.

CONGENITAL ANOMALIES, HISTOLOGICAL AND PATHOLOGICAL ANATOMY.

HERRNHEISER⁸⁸_{No.12} reports a case of bilateral congenital *anophthalmos* in a girl of good physical but deficient mental development. Similar cases are reported by Neary¹⁹⁰_{7Jan.} by Strjeminski⁷⁸_{Jan.} and by Ernrot.⁷⁸_{Apr.} The last, Ernrot observes, is the third case he has had in nine thousand patients. Menacho⁵⁹_{Oct.6} also reports a case of congenital absence of both eyes. A case of double *anophthalmos* is reported by our corresponding editor, Dr. Chiralt, of Seville, Spain.

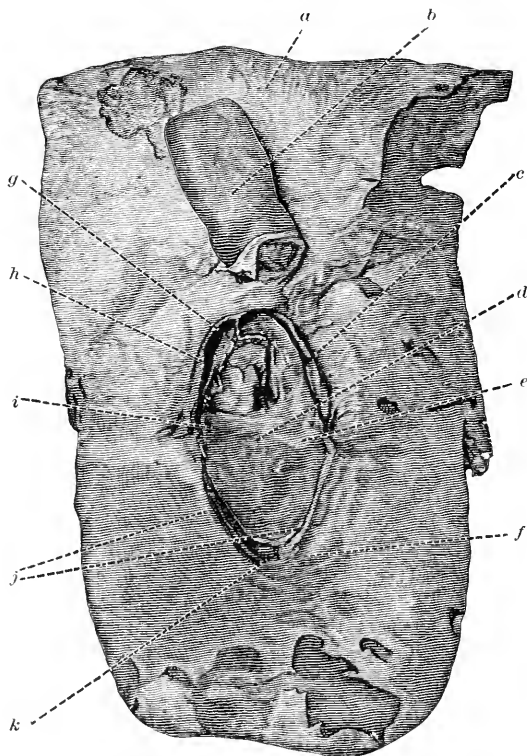
Holden's case⁵⁹_{Aug.11} of *aniridia* is remarkable for the number of complications present; there was cataract, dislocation of one lens, nystagmus, and strabismus. Theobald³⁴⁷_{July} had a case of double congenital *irideremia* in a child whose mother had a congenital coloboma of each iris. A case of congenital *irideremia* of Hirschberg¹⁹⁰_{Jan.} in a child of five years was followed by lenticular displacement and opacity, with increase of tension. The cases of complete double congenital *irideremia* reported by Felser⁷⁰¹_{May, Sept.}^{78 showed the influence of heredity. Creuze³⁵³_{Aug.} had two cases of congenital *malformations of the lids*, one consisting in an obliteration of the external angle by the skin passing over into that of the temple and cheek, which required an autoplasic operation, and the other of a coloboma of the lid, leading to keratitis and staphyloma of the globe through the opening. Six cases of congenital *coloboma* of the uveal tract are reported by Bock.²⁸³_{No.23} The two cases of so-called *coloboma* of the macula described by Silx²⁵⁴_{Mar.} are believed by the author to be the result of an intrauterine choroiditis, the difference between the appearance of this and an ordinary choroiditis being accounted for by the non-pigmented condition of the fetal eye. The colored plate is here reproduced from the original.}

De Lapersonne,²⁷⁴_{Mar.} following the trend of opinion as regards the prenatal inflammatory origin of many *colobomæ* of the choroid, optic nerve, etc., seeks the origin of a case of coloboma iridis in the same condition, to the exclusion of the hypothesis of an incomplete closing of the ocular fissure. He regards it as a variety of irideremia. The concurrence of peripheral opacities of the cornea (exudates) with iris coloboma and irideremia supports his view. Syphilis and tuberculosis are credited as the causes of the inflammation. That colobomæ occur most frequently in the lower half of the eyeball is accounted for as being the part in which the union takes place later, and thus it forms a *locus minoris resistentia*. Knoepfler¹⁸⁴_{Mar. 15} had a case of *coloboma* of the iris, and the concurrent astigmatism of the eye is explained as due to defective action of the ciliary muscle corresponding to the position of the coloboma, the meridian of least refraction corresponding to the direction of the irido-choroidal coloboma.

Nordman⁷⁸_{Oct.} had two cases showing the gradual transition between a simple *coloboma* of the iris and choroid and a true *microphthalmos*, the gradual difference depending upon a more or less defective occlusion of the fetal ocular fissure. No hereditary element was known. Vassaux's study²⁷⁴_{Nov.} of the development of the eye of the rabbit may conveniently be studied in this connection. Magnus records³⁵³_{Dec. '87} a case of *bilateral congenital microphthalmos* accompanied by coloboma of the right optic nerve. The details of six cases of *microphthalmos* are given⁸⁸_{No. 12} by Dr. Herrnhaiser. There was nystagmus in two of the cases and deficient mental development of two. Fitzgerald¹⁹⁰_{Jan.} also had a case of bilateral microphthalmos. The most excellent study of Hess²⁰⁴_{Bd. 34, H. 3} of the pathogenesis of *microphthalmos* cannot be condensed into a few lines. It is based upon the careful study of four bulbi, but the author concludes that they do not confirm the theory of Deutschmann that these anomalies are due to fetal inflammatory processes. The various theories put forth in explanation of the pathogenesis are examined and the results of the author's examinations compared with them. The theory of Arlt (non-closure of the optical cleft), rather than that of Kundry (cerebellar failure of development), seems to derive more support. The essence of the matter is thought to consist in a displacement of the heterogenetic limits of the mesodermal developmental tissues out of which are de-

veloped the external coats of the eye on the one hand, and, on the other, the lens; and in this it was the latter tissue that suffered. It was an atypical connective tissue development, and not an abnormality of vascular evolution. Becker²⁰⁴_{Bl.34, 11.3} gives a thoroughly scientific examination of a case of *microphthalmus congenitus unilateralis* in a child dying at the age of six months. The globe was about half the normal size, and yet the orbit was reduced in size, as compared with that of the fully developed globe of the opposite side, by 3.2 millimetres vertically, five millimetres horizontally, and the roof was also flattened. The conclusion is reached that the failure of the ectodermal invagination is the essential explanation of the anomaly. Failure in the involution of the primary optic vesicle seems also certain. The discussion of the individual anomalies is thorough and detailed. Oliver¹⁰⁷⁰₈₇ describes a case of *coloboma* of the iris, lens, and choroid, with a study of the visual fields. The iris coloboma was in the lower inner quadrant, having the form of a keyhole. Central vision for form was, in the right eye, reduced to light perception, and, in the left, to one-fiftieth, with correcting lens. Central color perception was normal. The study of the fields of vision presents peculiarities of interest. Despagnet¹⁷³_{Sept.} presented a case of monocular persistence of the *Canal of Cloquet* without other abnormality of the eyes. After correction vision was $= \frac{1}{6}$. Rumszewicz⁷⁸_{June} reports a case of the extremely rare *persistent pupillary membrane* having been attached to Descemet's membrane and leaving a mark there. There was a similar mark upon the anterior capsule of the lens. Thomson⁸²_{Feb.18} also describes a case of persistent pupillary membrane. Collins⁴²³_{July} describes six similar cases. He alludes to the results of errors in diagnosis that arise from mistaking the condition for synechiae due to iritis. Valude and Vasseau²⁷⁴_{Jan.} communicate an interesting case of *cyclopean eye*, of which we present an illustration. Our corresponding editor, Dr. Landolt, thus describes the specimen: As usual, the eye was situated in the middle of the face, occupying the place of the nose. Its shape was rhomboid, with the longer diameter placed vertically. The four sides looked like the borders of eyelids, and had eyelashes, tarsus, meibomian glands, muscles, and fatty tissue. Upon the left and lower side there was a normal-looking lachrymal point. The lachrymal canal was a *cul-de-sac* only a few

millimetres long. In the upper and lower corners were caruncles, but there was no trace of a lachrymal sac or nasal duct. In the middle of the rhombus was a single bulbus, covered by the conjunctiva, the last being adherent to the cornea. There was, therefore, a single sclera, a double cornea, two pupils, and two lenses. The cause of the anomaly is ascribed to arrested development, due to the *sulcus cerebro-spinalis* closing too soon. The



VALUDE : AN EXAMPLE OF A CYCLOPEAN EYE.

(*Archives d'Ophthalmologie.*)

a, forehead; *b*, nasal appendix; *c* and *h*, edge of lids, with lashes; *d*, centre of cornea; *e*, left edge of cornea; *f*, solitary lachrymal canaliculus present; *g*, vestige of caruncle; *i*, right edge of cornea; *j*, edge of lid, with microscopical lashes; *k*, well-developed caruncle.

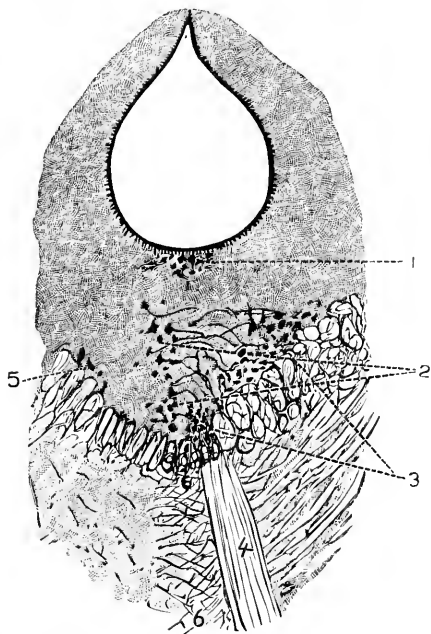
case confirms the rule that in cyclopean eyes all the parts may be double or united in every degree, except that there is never a single lens or a double vitreous. Hannover¹⁶_{May} publishes the details of the examination of eighteen *cyclopic fetuses*. There is often coincident hydrocephalus and other malformations, such as hare-lip, arrest of development of the genital organs, increase in the number of fingers and toes, etc., etc.

Spitzka,²¹²_{July} in a series of physiological and pathological experi-

ments, sums up the following conclusions as to the *centres of the oculo-motor nerves* and their co-ordinators: Four cell-nests are recognized as constituting this complex nucleus in the angular division of the aqueduct gray. The main part of the oculo-motor originates from the main nucleus; its most cephalo-mesal fibres originate from the nidus of Westphal; the caudo-mesal fibres probably originate from the sagittal nidus. No oculo-motor rootlets originate from the posterior division of the main nest, and reasons are advanced for believing this the origin of the orbicularis oculi fibres of the facial nerve. Spitzka recapitulates his instructive atrophy experiment (see annexed illustrated cut). The left third pair and left optic tract were divided, and it was found that the main nucleus was normal in the right, but in the left only the posterior division (the internal rectus centre) was present. Spitzka's experiment is confirmatory of v. Gudden's conclusion, that the oculo-motor has a decussated or double origin, one meso-caudal representing the decussated origin, and the other found lateral, the main nest giving origin to the non-decussating fibres. The innermost and most posterior rootlets are those that decussate, and these are proved to be the roots of the rectus internus fibres.

Debierre³⁶³_{Apr.} concludes that the so-called *dilator muscle of the iris* does not exist, and that the fibres usually considered as belonging to this belong either to the sphincter or to the conjunctival tissues.

Ewing²⁰⁴_{Bd.34,H.3} thinks he has discovered *connective-tissue fibres* between the tendons of the ciliary muscle and the posterior surface of the iris, which may throw light upon the question of the dilating mechanism of the iris. Straub²⁰⁴_{Bd.34,H.3} found in the *vitreous humor*



TRANSECTION THROUGH OCULO-MOTOR NIDUS OF CAT, WHOSE LEFT THIRD PAIR HAD BEEN DESTROYED.

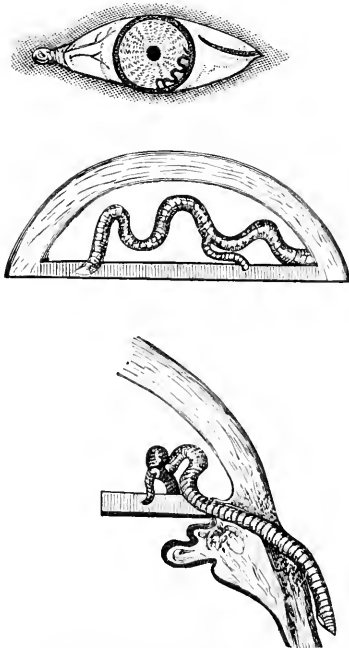
(*Journal of Mental Diseases.*)

1, subendynal cell mass; 2, crossed nidus of third pair (sagittal nidus); 3, main or uncrossed nidus; 4, intact right root; 5, nidus symmetrically developed notwithstanding the unilateral destruction of the third pair, and identical with the nidal centre, eliminated by Mendel through peripheral destruction of the orbicularis palpebrarum; 6, raphe.

the film-like tissue similar to that found by Brücke and Hannover in animals. These delimiting structures interpenetrate the vitreous, forming closed cells and inclosing thin lymph, and form a *membrana limitans hyaloidea*, anterior and posterior. The vitreous humor is, therefore, only to fill out the eye, and has a function and structure unlike that of any other tissue of the organism. The firm attachment of the hyaloid to the ora serrata explains the peculiarities of certain synchyses, which arise as shadows of these fluttering membranous tissues.

The conclusion of Jęgorow's extensive studies⁷⁸_{Mar.} concerning

the *ophthalmic ganglion* is that it is a cerebro-spinal ganglion but with two roots, the one being sensitive (trigeminus) and the other motor (oculo-motor). According to Dr. Landolt, corresponding editor, the anatomical researches of Delbet²⁷⁴_{Dec. '87} on the *nerves of the orbit* are valuable alike to the anatomist and to the practitioner. For example, it is proved that the external nasal nerve is not accessible from the inner angle of the eye, since it divides long before it reaches the orbit, and therefore the claim of successful stretching of the nerve in glaucoma is unfounded because impossible. The only portion of this nerve that may be operated upon surgically is the middle group of the terminal branches. In studying the ophthalmic ganglion the



ANOMALOUS EXTENSION OF THE
EXTERNAL ANTERIOR CILIARY
ARTERY.

(Zehender's klinische Monatsblätter.)

author once found a ciliary fibre which in passing to the anterior hemisphere came so near the external rectus that it might easily have been severed in a tenotomy. Dessauer³⁵³_{Aug. Sept.} describes a curious and interesting case of an anomalous course and extension of the left *external anterior ciliary artery* as shown in the annexed cuts. In the first figure the external appearance is shown; in the second and third figures the course of the artery in the anterior chamber and its entrance through the sclera and iris.

Lang and Barrett⁴²³_{Jan.} call *cilio-retinal vessels* those entering the optic nerve near the margin of the papilla. These were found in forty-eight patients certainly to exist in 16.7 per cent. and in 6.3 per cent. their existence was probable but doubtful. The excellent investigations of Weiss¹¹¹⁴ concerning the *length and contour of the optic nerve and the relation of the same to changes in the papilla and to myopia* are of instructive interest. In general the hypothesis of Jäger as regards the cause of myopia being due to ectasia of the posterior section of the globe is not proved, but that of Stilling, which ascribes it to stretching and displacement of the optic nerve entrance is confirmed. The latter was found to be great when the nerve is short and stretched; little when the extent of movement of the globe is great. The myopic malformation takes place only in the soft and growing eye. Stilling's hypothesis that the optic nerve strain is due to the peculiarities of the superior oblique muscle is not assented to by Weiss. The report contains the details of eighty-eight cases examined as to extent of bulbar movement, shape and position of the papilla, etc. They are divided into three groups, the first comprising thirty-one cases in which the rolling movement of the globe was considerable, *i.e.*, greater than seven millimetres. There was no strain upon the optic nerve entrance and the papilla was round. In the second group, cases thirty-two to sixty-one inclusive, the roll of the globe was greater than 5.5 millimetres and less than seven. The nerve is put to a greater or less stretch in movements of the globe, and the papilla is often somewhat obliquely displaced. In the third group, comprising the balance of the cases, the roll of the globe was less than 5.5 millimetres, with proportional consequent stretching of the nerve in ocular movements. The papilla was often clearly wrenched in an oblique direction; a conus was present in some cases with posterior sclerectasia.

The conclusions of Gunn's study⁴²³_{July} of the *nature of the light-perceptive organs* are thus given:—

That all light-perceptive cells are modifications of epithelial cells, or developed from the same embryonic layer which forms them.

That the ends of these cells corresponding to the cuticle have generally cuticular structures formed in the shape of rods.

That the opposite ends of these cells are either directly con-

tinued as nerve-fibres, or are connected with ganglion cells, and ultimately with nerve-fibres.

That pigment is practically always present, either in the light-perceptive cells or in close connection with them. Exceptions exist where a tapetum is present, and in the rare albino individuals having eyes of high types, but then non-pigmented cells always exist, which are evidently capable of performing similar functions to those of the pigmented cells, though in a minor degree.

That the pigment-cells have evidently the property of secreting chemical fluids according to their exposure to light and shade, and that the pigment contained in them is doubtless of service as being light-absorbent, and thus aiding a rapid transformation of light-energy into protoplasmic action.

The following cuts, which are reproductions from Hirschberg's

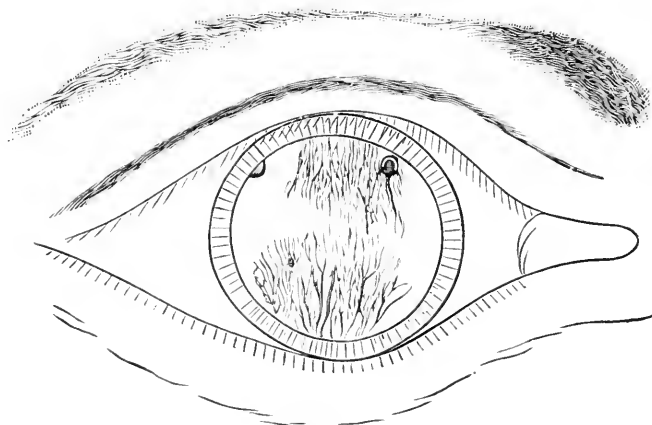


FIG. 1.
(*Centralblatt für Augenheilkunde.*)

cases of syphilitic keratitis, are so instructive that we here give them with a few lines of description. Fig. 1, hereditary type, twelve-year-old child, sketch made six to eighteen months after cessation of active inflammation. Fig. 2, female, twenty years of age, diffuse type of inflammation, sketch made three years after inflammatory subsidence. Fig. 3, fourteen-year-old boy, diffuse keratitis iridectomy, sketch made three years after the attack. Fig. 4, eight-year-old girl, diffuse keratitis, sketch made four years after the commencement of the attack. Fig. 5, nine-year-old girl, diffuse keratitis, sketch made six years after the beginning of the attack. Fig. 6, seventeen-year-old female, diffuse keratitis

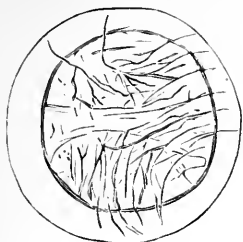


FIG. 2.—Right.

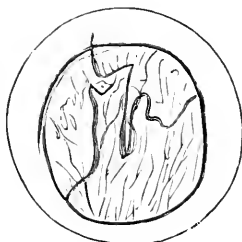


FIG. 2.—Left.



FIG. 3.

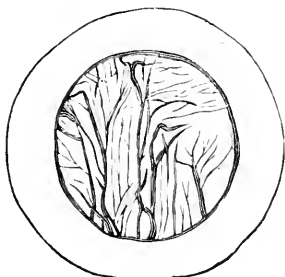


FIG. 4.—Right.

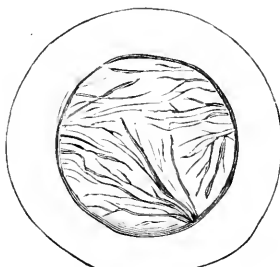


FIG. 4.—Left.

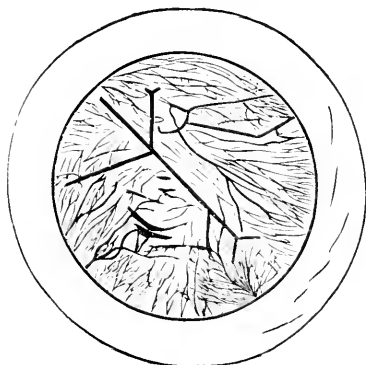


FIG. 5.

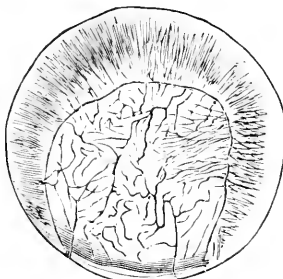


FIG. 6.

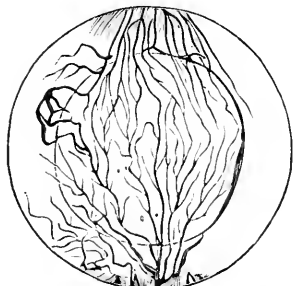


FIG. 7.



FIG. 8.

(Centralblatt für Augenheilkunde.)

iridectomy, sketch made thirteen years after the beginning of the attack. Fig. 7, female at twenty-nine years, sketch made eight years after an attack of double diffuse keratitis. Fig. 8, female at twenty years, hereditary syphilis, the sketch made of the nasal half of cornea alone.

Schmidt¹⁰⁷² gives the results of his extensive experimental researches in the *bacteriology* of trachoma and other conjunctival diseases. They are valuable, but present nothing essentially new. Schmeichler⁸¹_{June 2} and Fernandez¹⁰⁷³₁₈₈₈ also treat the subject, summarizing the findings of others. Frick's monograph¹⁰⁷⁴₁₈₈₈ upon the micro-organisms of the conjunctival sac is a noteworthy contribution, and gives an excellent review of the subject.

Van Rijnberk, our Amsterdam corresponding editor, sends us Halbertsma's results in reference to the pathogeny of hypopion keratitis. Inoculations with *aspergillus flavescens* showed intraocular emigration the moment Descemet's membrane was perforated.

Pukala¹¹¹⁵ discusses blepharitis papillaris in relation to the superficial and deep inflammations of the cornea. Nothing is presented that is worthy of note.

PHYSIOLOGY.

By means of an aplanatic and achromatic spherical lens (Hartnack, of a magnifying power of twenty to twenty-two times, at a distance of twenty-five centimetres) Friedenwald¹⁹⁰_{Feb.} has been able to satisfactorily see the *circulation* in new-formed corneal blood-vessels.

Wilson³¹⁷_{Dec. 27} proposes to do away with the common fraction system of *notation* in the registering of acuteness of vision, and thinks that a way is opened toward obtaining a much-desired simplicity and avoiding the objectionable features of numerators and denominators, by assuming "that visual acuity may be measured by the ratios between the heights of the smaller letters designated at a given distance from the eye, and that these ratios may be expressed in terms of series I, 0.9, 0.8, 0.7, etc., 0.09, 0.08, etc.; the intervals of which can be made to serve all necessary accuracy, and which is extensive enough for all practical demands. Thus, instead of writing $V = \frac{20}{20}, \frac{20}{40}, \frac{20}{100}, \frac{18}{200}$, etc., we may write $V = I, 0.5, 0.2, 0.9, 0.05$, etc." Sanford²⁸³_{May} has made a most elaborate and painstaking investigation upon the *relative legibility of the*

small letters. Both distance and time tests were pursued. The results are interesting, yet so complex that it would be impossible to reproduce the tables here without so abridging them as to render them useless. Gillet de Grandmont²⁷⁴_{May, June} has constructed a *self-registering perimeter*. It practically consists of two semicircles crossing one another at right angles, each quadrant being supplied with a movable carriage containing various colors, which can be brought in combinedly or separately to the centre of fixation. The position where the object is first recognized is marked by pressing upon a button-register. The peripheral point is automatically taken upon a small sheet of cardboard.

A *portable campiméter* has been devised by Azoulay.⁷³_{Nov. 17} It is composed of a metallic semicircle graduated into degrees, supported in the centre by a thin, stiff rod, and connected at each extremity by a cord. The advantages claimed are portability, exactness, use in any position, ease of adjustment and manipulation, and cheapness.

By a series of experiments upon the living eye of rabbits, Eissen, of Bielefeld,²⁰⁴_{Bd. 54, H. 2} has arrived at some interesting and valuable conclusions. *Increase of intraocular pressure* was affected by the employment of a double manometer, whilst the changes of *curvature in the cornea* were studied by the ophthalmometer of Javal and Schiötz. Both morphia and curare were used during the experiments. The *résumé* of his work is as follows: 1st. The rabbit eye shows physiological intraocular pressure about twenty-four to twenty-five millimetres mercury. 2d. The relative increase of this physiological intraocular pressure changes the curvature of the cornea, in a number of cases, increase of five to ten millimetres being enough to do this. An increase of twenty-five millimetres above the normal intraocular pressure causes change in the corneal form in every instance. 3d. It proves the statement of Helmholtz, that the corneal curvature, with the exception of individual idiosyncrasies, is dependent on the pressure of the fluids of the eye, and that the radius of curvature is in direct proportion to the intraocular pressure. (He found that while the mercury pressure had reached one hundred and ten millimetres, the longest radius of the corneal curvature showed an average increase of 0.028 millimetre, whilst if the pressure remained limited to twenty-five millimetres the radius of corneal curvature gave but an average increase of 0.046 millimetre.) 4th. By gradually increasing intraocular pressure,

the resident astigmatism shows a primary transient increase which, by relative lowering of pressure, becomes curiously lessened, at least within the degrees of pressure experimented with. 5th. Normal astigmatism becomes reversed by increase of intraocular tension, the greater axis changing from the horizontal meridian toward the vertical. This explains the observations of perverse astigmatism ("perversem astigmatismus") found in glaucoma. 6th. No two eyes of all those experimented with gave exactly similar results under similar conditions of pressure.

In a series of injection experiments upon excised eyes of freshly killed pigs, oxen, and sheep on the *escape of fluid from the aqueous and vitreous chambers under different pressures*, Priestley Smith⁷⁶_{July} states that his "experiments do not suffice to show whether there is under normal conditions a persistent stream from the vitreous to the aqueous chamber, but they do show that fluid passes easily from one chamber to the other under a very slight excess of pressure on one side of the diaphragm." He says, however: "It seems certain that so long as the diaphragm remains permeable and the intraocular fluid diffusible, any tendency to excess in either chamber would be quickly neutralized by osmosis into the other, an arrangement which is, no doubt, essential to the stability of the lens in its proper position. If the normal stream of fluid which enters the vitreous from the ciliary body is of larger amount than the minute stream which escapes around the central vessels of the optic nerve, then, unquestionably, the surplus, whatever it may be, escapes through the anterior chamber." Bellarminoff²⁴⁶_{v.33,p.39} gives a description of his apparatus for the measurement of *intraocular pressure* and *movements of the pupil*. He employs for this purpose bromide of silver paper. The apparatus is very complex (Maklakoff). Wahlfors⁸_{Sept.13} has also made a series of manometric observations in both normal and diseased eyes. He has shown that overfilling of the intraocular *circulation* is associated with increased intraocular *tension*.

William Harkness, of the United States Naval Observatory of Washington, sends quite an ingenious *pupillometer*, consisting of a wedge which moves in front of a slit. It is to be used entoptically.

Jessop continues his valuable lectures on the *pupil*.⁷⁶_{June, July} The *movements of the iris* which may be under vasomotor or respiratory influence, and which are subject to light reflexes (both direct

and indirect) and sensory reflexes, and even a third, denominated "pain reflex," are described in detail. Based upon an examination of the pupils in health of over nine hundred individuals, he obtains valuable data as to the size and activity, associated action, shape, and the various other conditions, too numerous to attempt to detail here, but which should be studied most carefully in the original article. Jegerow²⁴⁶_{Nov. '87} has shown by experiment that the cervical sympathetic has no effect upon pupillary dilatation in birds.

Raetterer³_{No. 13} believes that he has discovered muscular fibres to which he attributes the *dilatation of the pupils*. Brown-Séquard and Debierre³⁶³_{No. 16} contest this opinion on physiological and anatomical grounds. The latter author demonstrates that the fibres of Raetterer are merely connective tissue. He, therefore, admits with Chauveau, and many older authorities, that the dilatation of the pupil corresponds to a state of rest. Raetterer's statement has found a defender in Picque,²⁷⁴_{June} who again maintains the active nature of the dilatation of the pupil, attributing it to a special muscle innervated by the cervical sympathetic. Jessop⁸_{Sept. 6} brings both the short and long ciliary nerves into play in the *movements of the iris*. They are opposed in action. Stimulation of the former produces complete myosis, whilst stimulation of the latter causes maximum mydriasis; section gives partial dilatation and partial contraction. Coccius⁸_{Sept. 6} gives *accommodative action* to the *tensor choroideæ*, assuming that it changes the form of the lens by action upon its posterior surface, and thus thinks that the present theory of accommodation must be modified.

According to Landolt (corresponding editor), Reymond, of Turin, at the International Ophthalmological Congress at Heidelberg, after speaking of the work done by Donders on this subject, turns his attention to the *range of relative accommodation*, particularly in positions oblique to the median plane. In these directions both eyes cannot accommodate exactly and simultaneously for the point of fixation, as the range of accommodation of each eye varies greatly, according to whether it is in adduction or abduction. In the lateral positions there are, therefore, zones in which the normal condition of exact binocular vision is impossible. These zones widen the farther we go from the median plane, and in the extreme positions we have the physiological strabismus. Suppose the normal relations between convergence and accommodation

changed, the zone will widen and we will have definite strabismus, even while seeing in the median plane. The author speaks of the influence which the natural equilibrium of the muscles or the diminution of sight of one eye can have over the movements of the eyes.

Van Rijnberk, corresponding editor at Amsterdam, Holland, sends us the following note on the *absence of trochlear motion in lateral visual deviation* by Van Molt¹⁰⁷⁵_{p. 1}: "For a clear insight into the physiology, as presented in the paper, the knowledge of lateral convergence is of great importance. The visual point is not always in the median plane; it often lies outside, so that we have not a symmetrical but an asymmetrical convergence. Van Molt, upon examination of the subject, found the following results: 1. At a decline of about thirty degrees of the visual line, symmetrical convergence takes place *without* trochlear motion. 2. At the same decline, likewise lateral convergence. 3. At convergence to the right, eventually to the left, in the primary positions for convergence, C (Donders), the plane perpendicular on the visual plane, and parallel with the base, is the plane of the horopter for the retina meridians directed diagonally to the right, eventually to the left." Eklund, corresponding editor at Stockholm, Sweden, gives us a brief *résumé* of Schiff's studies⁷⁰⁵ in reference to the *angle of convergence* and the *visual line*. This the author does by the aid of prisms and metre measurements. He has calculated them in both health and disease. The relation of divergence and convergence is also spoken of, as well as the important bearing of accommodation upon them both. An *instrument* designed to assist in the determination of the *relations of the visual lines* to one another has been devised by Stevens,⁵⁴⁹_{May 5}. It consists of a horizontal rod holding a series of prisms, in front of which, at one-half metre's distance, there is a small tablet containing a white cross. Van Rijnberk writes us that Mulder,¹⁰⁷⁵_{p. 340} not satisfied with Aubert's and Helmholtz's opinions about vertical direction when inclining the head to the right or to the left, is still at work upon the subject, having instituted a great number of experiments upon different persons.

Heyl⁴⁶² departs from the ordinary laboratory method by measuring angles or locating points for the precise definition of the *visual axis*, and seeks for answer in the domain of speculative physiology. After defining the *gesichtslinie*, the *blicklinie*, and the so-called

visielinie, he says: "When one is walking along the street, with the mind absorbed in thought, the macula of each eye is pointing at one point in space. In this there is no conscious exercise of will, and yet the maculae will give what I conceive to be the initial position of the visual axis." He goes on to say that we are not dealing in this case with a mathematical fiction, but with an *innate* mental conception. (The *visielinie* is likewise a mental conception, but which lies higher up in the consciousness than the visual axis.) He further states that "the *visual axis* is a function of binocular single vision," and draws the conclusion that "the visual axis may be defined as a mental conception low down in the consciousness, which may be diagrammatically represented by a line extending from the macula lutea to a point on the median plane and forming a certain angle with it termed the axial angle." It is a function of binocular single vision, and its initial position is determined when the muscles are in what is ordinarily described as a state of rest, *i.e.*, not being acted upon by the will. He then discusses the obscure problems, physiology of muscle and the development of the macula lutea.

Lang and Barrett⁴²³_{v. 12, part 1} have examined the frequency of *spontaneous venous pulsation on the disk*: 73.8 per cent. showed distinct pulsation, in 14.8 per cent. it was doubtful, and in 11.4 per cent. it was entirely absent. Mittendorf¹⁰⁷⁰₁₈₈₇ relates an interesting instance of *transmitted pulsation* at the fundus oculi. The pulse, which was synchronous with the heart's action, was visible in two band-like processes, the one skirting across two veins, the other, a smaller one, connected with an artery. In all other respects the eyes were normal. Another pressure scotomata has been added to the list by Koller.²⁷⁴_{June} The eye to be experimented upon is directed toward a dimly illuminated white surface, whilst its fellow is closed. If slight pressure be made through the eyelid by means of the finger-tip, there will be made to appear, in addition to the ordinary phosphene, a second spot, which is triangular in shape, with its base turned outward.

Gould¹⁹⁸_{Oct.} suggests that the *homing instinct* of some animals is really the physiological action of an organ of the magnetic sense—an organic magnetometer capable of appreciating the subtle difference of the earth's magnetic and electric forces in different localities. This function, he suggests, may possibly be associated with the

pineal gland (the probable remnant of a once functional median eye).

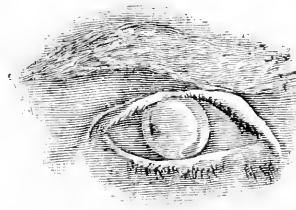
Schaefer,⁴⁷_{Apr.} in continuing his series of interesting experiments upon monkeys, substantiates Munk's assertions that there is a relation between certain parts of the *retina* and the *occipital lobes*, but differs from him as to the exact position. He believes, however, "that, to arrive at detailed conclusions, we must await the results of perimetric observations in cases of cerebral lesions in the human subjects, and that these experiments on the visual area of the monkey are chiefly of value as affording indications of the kind of results which is to be looked for in man." According to Landolt (corresponding editor), Lannegrace has experimented on the brain of monkeys, with the idea of determining the *visual centre or centres*. These are his results,¹⁷_{p. 729, '87}: In order to make a monkey blind he had to remove certain parts of the parietal and occipital regions on both sides. If any one of these four regions be left intact, the sense of sight remains in its integrity. Only very widely spread lesions, therefore, can destroy sight entirely. The sight, properly so called, is abolished, but the perception of light persists. Two distinct centres of vision must be recognized: (1) a centre in the mesocephalon, for the simple perception of light; (2) another centre in the cortex cerebri, occupying the regions already named, for the precise sensations (perception of form). Isolated lesions of the occipital zone give rise to disturbances of very short duration (one to two hours) in both eyes, consisting in homonymous hemiopia. Ophthalmoscopic examination does not show any alterations of the optic nerve in these cases.

After many years of unsuccessful efforts in endeavoring to *photograph the living optic nerve*, Colm¹⁰⁰_{Mar.} thinks the discovery of "blitzpulver" by Gaedieke and Miethe a step forward in the right direction, and hopes that by proper instruments he may be able to obtain a good picture of the living human fundus oculi. He recommends the employment of a minimum quantity of the mixture of magnesium and chlorate of potassium. By this method he has obtained very fair photographs of the anterior portion of the organ, as in the accompanying illustrations, and a satisfactory image of the background of Perrin's artificial eye. It is interesting to note that in all of these pictures the pupil remains dilated, on account of the action of the sensitized camera-plate having

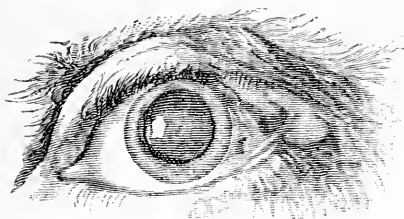
been accomplished before the living sensory-motor action has been completed. The communication of Dubois-Reymond,¹⁹⁰ made a few weeks later, is substantially the same. Sinkler and Oliver,¹⁰⁷⁶ in a note upon *retinal photography*, assert that the only present



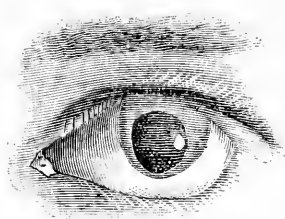
NON-ATROPINIZED PUPIL OF A TWENTY-YEAR-OLD EMMETROPIC STUDENT.



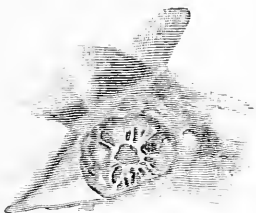
NON-ATROPINIZED PUPIL OF A TWENTY-ONE-YEAR-OLD EMMETROPE (NEGATIVE).



CATARACT.



CONGENITAL COLOBOMA IRIDIS IN A SEVEN-YEAR-OLD CHILD.



PERSISTENT PUPILLARY MEMBRANE.



PERSISTENT PUPILLARY MEMBRANE.

PHOTOGRAPHS OF THE ANTERIOR PORTION OF THE EYE.
(*Berliner Klinische Wochenschrift*.)

difficulty experienced is the interfering corneal reflex, which part of the subject is under experiment.

Boehm³⁵³ has followed Wolffberg's experiments in ascertaining a new method of *graduated quantitative estimation of color perception* as another means of differential diagnosis between refractive error and pathological change. He not only believes that he can

support Wolffberg's claims, but finds himself able to *detect the existence of astigmatism*. Acting upon the suggestion of Frost, Stephenson repeated the experiments, and comes to the conclusion that although the test possesses some scientific interest, yet he fears that it is of no practical value as a help to differential diagnosis, and although there may be, and in all probability is, some ratio between form and color sense, yet he is driven to the conclusion that Wolffberg has not correctly ascertained it, and that his test is open to many sources of error from its purely subjective nature. Deneppe,¹⁷¹_{June} in his article on the *perfectibility of the chromatic sense* in the human species, asks this question: "Can the chromatic sense be brought to perfection?" He thinks that it can. Based upon comparative studies with hearing and admitting the superiority of the female over the male in the choice and selection of color, together with the less amount of color blindness amongst the better classes, as shown by Brailey, Keyzer, and Carl, and in the increase of age, as noticed by Holmgren and others, he believes that the perceptive elements for color can, by proper exercise and methodical education, be made to augment their excitability to the action necessary for the recognition of many colors the want of which places them in the category of color blindness. Bloch¹²⁶ believes that the reason of the *lessening of the interval in successive luminous perceptions* is really dependent upon the successive gains of power of the sensory material to receive the luminous impression.

McKeown⁶_{Nov.7} reports a case of a man of sixty-three, who had been blind since one and a half years of age. An iridectomy restored sight. The writer says: "His *color perception* was remarkably good; he distinguished not only the well-defined colors, but also different shades of the same color, sometimes even when these differences were not very marked. His color education was very rapid. When I first spoke to him upon the subject I found that he was pretty familiar with green, blue, and red. Some patients in hospital had given him instruction. He came to know green by examining a quilt of that color upon his bed, blue by inspecting a blue-and-white-striped shirt which he wore, and red from seeing the lining of a hat. He afterward came to know yellow, brown, etc., from having these colors shown to him a few times. The coins (involving shape, size, and color) were soon mastered."

Van Rijnberk, our Amsterdam corresponding editor, says:—

"In relation to the experiments of Boll and Kühne and Ewald, Hamburger⁵⁸³_{p.284} has examined the *sensitiveness of staves red for some kinds of monochromatic light*. His results were in the main the following: The staves red of the winter frog has the greatest sensitiveness for rays between E. C', and F. There is very little difference between the sensitiveness for E. C, and that of F."

Maklakoff (corresponding editor at Moscow, Russia) gives a description of Segal's method⁶⁵³_{Jan.} for the determination of color perception. He does not think well of the plan, which in reality consists of nothing more than studies in color perimetry, and says that the article is filled with errors.

Westhoff's¹⁰⁷⁵_{p.256} case of *erythropsy in aphakia* is of interest. A female patient, aged eighteen, whose left eye had been operated on toward the end of August by a discission and a successive linear extraction of a hereditary cataract, was examined in the latter part of December. The pupil-plane was almost quite clear. Visus, after correction = $\frac{5}{6}$. On the twenty-eighth day of the latter month, after a walk from 12 M. to 1.30 P.M., where much snow had fallen the day before, the patient saw with the left eye everything covered with a reddish color, which passed into blood-red in the evening. No other disturbance took place. Qualitative perception of colors normal. After a few days the phenomena had disappeared.

Passing from this to what is truly surrounded with mystery, we come to the so-called *colored audition*, a study which Baratoux in his book¹⁰⁷⁷ has given much attention. His researches seem to indicate that a relation exists not only between the auditory and the acoustic spheres, but between the other senses as well. In the words of our colleague, Dr. Landolt, "The phenomena color perception presents to us are complicated problems without promise of being solved for some time to come. Surely, however, the audition of color is enveloped in a mystery still more profound. Several authors have reported observations of cases in which the irritation of the acoustic nerve produced, besides audition, an impression of color. The color, however, perceived by these *voyants* differs widely under similar conditions. For example, the sound of the clarionet, red to one, is yellow to another; that of the piano, white in one instance, in another is blue. White is also attributed by some of these favored ones to the sound of the violin; whereas

there are those who see black in the music of this delightful instrument, besides in the shrillness of the penny whistle, and perceive a dull gray under the influence of the soft, sweet thrumming of the guitar. The higher the tone, the more intense the shade of the color. Thus, if the low tones are brown, the high notes are yellow. The human voice has also its color; but this, too, is not the same to all these visionaries. The inverse seems also to occur when the sight of certain brilliant objects produces a sensation of sound. Baratoux thinks these ocular results are dependent upon excitation through direct transmission of sonorous vibration. This view is also upheld by Urbanschitsch.

Féré⁷⁰³_{No. 21} recognizes a difference between *chromopsia* and ordinary *photopsia*. The first is a visual sensation of color, as just spoken of by Baratoux, and which has been further elucidated by Pedrono as the result of intracerebral association, as well as by Fornet and Ponchet. To the authors there seems to be a certain aptitude for these subjective changes in certain neuropathies and special varieties of impression.

Color Blindness.—Bickerton²_{Nov. 10} has been collecting evidence as to the true reason for accidents resulting from mistakes as to the color of signals. He cites the well-known ones of the steam-tug *Lumberman*, the steamship *Isaac Bell*, and the steamer *Austria*. The one happening this year between the steamer *Toronto* and the barque *Freidir* is carefully gone over. Several others are graphically given. The terrible disaster of the *Vanguard* and the *Iron Duke* in a thick fog, most probably caused by an uneducated seaman, who "had been twice treated for blindness in the right eye, which was the organ directed to the supposed ship," cannot be too carefully considered. He wisely says, "The subject is not a medical one; it is national, or, rather, international." The table shown on page 21, compiled by Armstrong,²_{Jan. 23} is so full of interest that we give it in full.

Based upon well-known fact, both from theoretical and practical stand-points, that many "color blinds," especially those of medium grades, have the power of differentiation, even by daylight, of the most difficult colors, when placed at ordinary metre distance, of wool selection employed in the detection and determination of color blindness, Oliver⁹⁹_{Aug. 2} has been induced, through a hope to overcome the dangers that might arise from this power in situations

EXAMINATIONS OF SEAMEN FOR COLOR BLINDNESS BY THE UNITED STATES MARINE HOSPITAL SERVICE.

YEAR.	CLASS.	1880.			1881.			1882.			1883.			1884.			1885.			1886.		
		Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.	Examined.	Color-blind.	Per Cent.
Photos.....		2,570	64	2.32	4,384	116	2.65	2,090	63	3.0	2,171	63	2.9	1,850	41	2.2	1,645	48	2.9	1,680	47	2.8
Revenue Marine.....		218	4	1.84	305	3	1.0	273	4	1.46	210	1	0.50	242	2	0.82	219	3	1.37	183	1	0.54
Seamen		630	3	0.48	....	..	....	....	..	....	....	..	....	....	..	....	757	4	0.53	1,025	11	1.0
Total.....		3,708	71	1.9	4,689	119	2.5	2,363	67	2.8	2,381	64	2.7	2,092	43	2.7	2,621	55	2.1	2,888	59	2.0

such as railways, marine, and naval service, where the safety of lives and the protection of property is oftentimes solely dependent upon the proper recognition of color at great distances and frequently through the intervention of more or less translucent media, to combine two modifications of his method of color selection to a simplified plan of the former procedure by which the candidate is placed in the actual position of after-work and under exactly similar circumstances as during employment. The method is divided into three parts: 1. The selection and registry of a definite number of loose wools from twenty-three pure and confusion match skeins thrown upon a dead-black surface at one metre distance. 2. The selection and registry of the same number of similar reflected colors under various intensities of diffuse daylight stimulus, placed at distances requisite for safety. 3. The selection and registry of transmitted colors under various intensities of artificial light stimulus placed at distances requisite for safety.

In addition to the advantages shown to refer to the first test alone, this method has the following additional ones:—

1. Much faster in time than any other method. 2. The

selection of loose wools at a distance. 3. No necessity for an expert except in doubtful cases. 4. Employment of the same character of signals for testing as is used in daily routine. 5. Placing the eye during testing at a distance necessary for future safety. 6. Bringing the eye during testing directly before the true condition of weather experienced as it is upon duty. 7. Test and match colors all graduated in proportionate size.

By the employment of movable slides containing "twin colors" and "triplet colors," arranged in diamonds, "pilot-letters," "trap-letters," etc., which can be placed in a dark-lantern, Grossman²_{Nov.10} has been able to make another practical test. The principal advantages of this test are: 1. Its extreme simplicity of application, which admits of its being carried out by *any person* with normal vision. 2. That the colors are shown to the candidate under conditions precisely similar to those under which they are seen when employed as signal lights.

In a case of successful localization and removal of a fibromatous brain-tumor with probable destructive basilar changes, where the fields of vision were reduced to two irregularly contracted right-sided areas in which nothing but form was discerned, Oliver⁵_{Oct.} found that two months after the operation, although they retained the same positions and embraced the same areas, they had gained partial color definition. The left field showed distinct and well-mapped areas for yellow and blue, with a small spot in which red was designated as "lead," whilst the right field gave a trace of color differentiation in a small central area. On the same date, the point of best sight with the left eye—even according to the patient's account—had gradually increased to qualitative vision, letters of number thirty dioptry type being properly named when swept across the situation of the best projection in the excentric field. With the right eye nothing definite could be determined, the patient constantly twisting his head in various positions and suddenly exclaiming, from time to time, "I see a black mark," or incorrectly calling an exposed letter.

Ryerson²⁵⁷_{Apr.} has had the opportunity of making an ophthalmoscopic examination of the eyes a few minutes before the death of an injured patient. The man was unconscious, respiration gasping, pulse uncountable, lower extremities paralyzed. The ophthalmoscope showed clear media, pale retina and optic disk,

retinal arteries scarcely perceptible, with an occasional pulsation of the veins, which were irregular in calibre and seemed to contain clots. "As life ebbed away all movements in the veins ceased," and "a peculiar haziness stole over the fundus;" the "observer could not determine whether this latter condition began in the lens or vitreous." "A few minutes later the cornea became wrinkled and nothing more was discernible of the fundus. The pupil was moderately dilated." The case is interesting by reason of the venous pulsation and the apparent formation of clots. The author throws out the practical suggestion that such examination would be of value to prevent premature burial and to detect malingering. He further says that those unaccustomed to the use of the ophthalmoscope could determine the question by oblique illumination.

SECTION II.

ERRORS OF REFRACTION AND ACCOMMODATION.

Tscherning¹⁷_{No. 57} in a series of researches has come to the conclusion that with few exceptions the *axis of the human crystalline lens* does not correspond to the visual line, this fact agreeing with the earlier researches of Helmholtz. He shows that it usually gives two deviations, one outward three degrees to seven degrees, the other downward of less degree. The first of these agrees with that of Javal, that the total astigmatism conforming to the rule is usually less than the corneal.

Reymond's monograph, "*Des Rapports de l'Accommodation avec la Convergence*," published in 1884, is now united with Stilling's essay, "*De l'Origine du Strabisme*," published one year later. Much has been added to the original work. They still practically adhere to their individual views. Stilling's assertion⁸_{Aug. 31} that *myopia* is frequently associated with low, broad bone formation of the face, and hypermetropia with high, narrow bone formation, cannot by any means be laid down as an inflexible rule. This year Weiss³⁵³_{Aug., Sept.} follows Stilling in reference to the rôle that the *superior oblique* plays in the production of myopia by an article on the relation between the form of the base of the orbit and the refraction error.

Several cases of *irregular astigmatism of the lens*, according to Gordon Norrie,¹⁹⁰_{Aug., Sept.} were caused either by an incomplete paresis or an irregular spasm of the ciliary muscle.

Schlösser has had an instance³⁴_{Nov.} of marked *unilateral corneal astigmatism* from compression of the eyeball.

Increase in the antero-posterior diameter of the globe and the formation of corneal asymmetry resulting in *mixed astigmatism* has been found by Gould¹¹⁹_{Nov.} as the result of a severe inflammation of the eye.

Schoen²⁴⁹_{Mar.} thinks that the so-called physiological excavation is more or less pronounced in almost every eye in which the accommodation has long been overexerted, as, for example, in hypermetropia, presbyopia, astigmatism, and in cases of conical cornea, whenever proper compensating lenses have not been used, and from this he declares that the diagnosis of *spasm of the accommodation* can be made in every case of well-pronounced excavation, with red margins around the papilla.

Theobald³⁴⁷_{Oct.} continues these thoughts and writes that, based upon recent personal observations, he is convinced that an astigmatism in which the meridian of least refraction is vertical, or nearly so, will, as a rule, give rise to very much more trouble—more asthenopia, more headache, and a greater likelihood of pathological changes occurring in the eye, than will one of equal or even greater degree in which the meridian of least refraction is horizontal or nearly so.

A high degree of *myopia* occurring in an unlettered mulatto field-hand¹²_{Aug.} has been examined and corrected by Bruns.

Fano²⁵³_{Dec. '87} contributes studies on the hypermetropia of infancy.

In a critical analytical study of *ametropia in our schools*, Tiffany¹⁶² has examined two thousand and forty cases, including the white, red, black, and mixed races, embracing several distinct nationalities. He arrives at the following conclusions:—

“1. I think that the principal information gained in these examinations is that 22.4 per cent. of the school-children have some anomaly of refraction or accommodation which should be recognized and corrected early.

“2. That the hazel eyes, of all the colors, seem to be the ones most affected.

“3. That the light eyes, upon the whole, are less liable to be ametropic than the dark.

“4. That the females have a larger percentage of anomalies than males.

"5. That there is a much larger percentage of hypermetropia than of myopia.

"6. That spasm of accommodation is a frequent anomaly.

"7. That the far-seeing eye of the red man is bedimmed by syphilization in the effort of civilization. (The Indian eyes seem to be emmetropic, but invariably their corneæ were more or less cloudy, in consequence of catarrhal or granular ophthalmia, most often of specific origin.)"

Crainicean⁸_{Sept. 6} contributes another statistical paper upon the *refraction of the eyes of school-children*. The usual formation and expected increase of myopia is shown.

Emerson¹⁹_{Aug. 4} gives an interesting example of *progressive hyperopic astigmatism*, which has been under his care for several years.

A form of myopia known as *symptomatic*, dependent upon local disease or traumatism, has been described by Mittendorf.⁹_{July 28} Various causes are assigned, such as forward dislocation of the lens, increase in lenticular density or thickness, plastic exudations, etc. In these cases the refractive condition is transitory.

John Green¹⁰⁷⁰₁₈₈₇ mentions a personal instance of *transient myopia* occurring in connection with iritis. He simply calls attention to this symptom without offering at present any speculation as to the manner of its production.

Bouvin¹⁰⁷⁵_{p. 171} has seen a case of *acute accommodation spasm* (Rijnberk) in a myope with astigmatism, who, after having been occupied for some time correcting proof-sheets in the twilight, saw everything at a distance, as in a haze. Re-examination of refraction showed a marked increase in both the myopia and apparent astigmatism. After thirty-six hours, the disturbance disappeared and the ametropia was found as before. Chauvel²⁷⁴_{May, June} has made a statistical and clinical report on *myopia and astigmatism*. After dividing myopia into nine degrees, he studies the various associated conditions in each, and arrives at the conclusion that although absorbing and atrophic crescents increase in proportion to the degree of the myopia, yet their size and situation bear no relation to the existent astigmatism. Fernandez, corresponding editor, Havana, Cuba, finds that *myopia* does not exist among the *negroes* of the island, but that *hypermetropia* is frequently seen among the *mestizos* and *native born*.

Under the term "megalophthalmus" (buphthalmos), Dürr⁸_{Sept. 6}

details five cases of compression with stasis of the vein of the choroid by abnormal position of the superior oblique muscle in its passage around the eyeball.

Woods¹⁰⁴_{Jan. 28} cites three instances of retinal detachment occurring in myopic eyes. They all appeared in high grades of the refractive error dependent upon posterior sclero-choroiditis. Harper⁶¹_{Jan. 14} adds several new cases which distinctly prove the causative relation of ametropia to ocular diseases. T. H. Smith⁸⁵_{March} gives timely advice upon the production of defective vision in the young from overcrowding of students in schools.

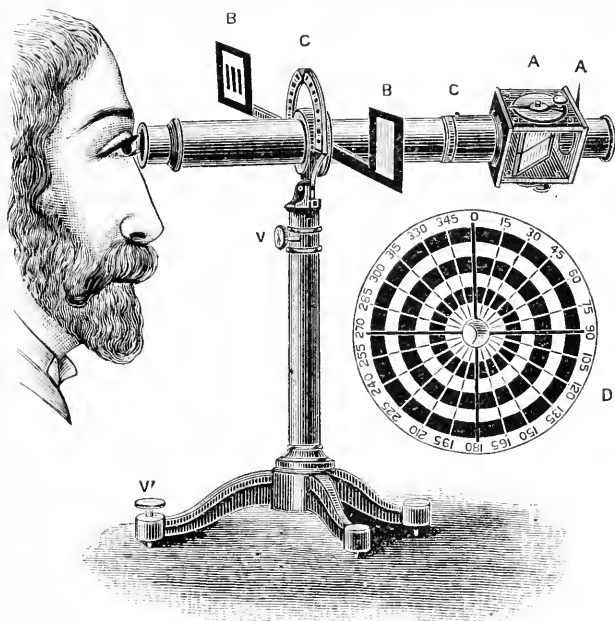
C. F. Prentice,¹⁰⁷⁸ of New York, has given us a small, well-printed, and tasteful book, containing an extremely valuable series of dioptric formulæ for combined cylindrical lenses applicable for all angular deviations of their axes. Careful study of the diagrams, which in themselves are works of art, is advised for those who wish to properly understand the refraction of combined congeneric cylindrical lenses (cylinders of the same class, both being convex or concave), and combined contra-generic cylindrical lenses (cylinders of the opposite class, convex and concave). The practical side of glass fitting from an optician's stand-point has been most excellently brought forward in a little volume by M. W. Bolme,¹⁰⁷⁹ of New Orleans. The chapters on decentring and fitting are amongst the most important. We not only recommend the book to those for whom it was written, but to the many oculists who may be situated in places where they are compelled to use their own mechanical manipulation in the adjustment of correcting lenses.

Reynolds⁴⁶² proposes, in order to do away with some of the defects in *graded lenses*, that no attempt shall be made to designate them by focal lengths, and that we shall either return to the old system of astronomical refractions, taking the quadrant of a sphere for the unit and dividing it into any desirable number of fractions having a common multiple, according to the radius desired to represent a stated angle, or that we shall have our lenses graded by the angle of refraction only. In the *designation of prisms* Jackson⁴⁶² makes the following excellent proposition: "A prism shall be designated by the number of degrees light rays are deflected from their course by passing through it in such a way that within the prism their direction is perpen-

dicular to the plane bisecting its refracting angle; that is, the minimum deviation the prism can produce. To avoid confusion between the old and new systems, the number of a prism according to the new might always be written or printed with a circle surrounding it. Thus "prism (2)" would indicate a prism whose refractive power, minimum angular deviation, is just two degrees, whatever may be its refracting angle.

In a series of investigations upon the resultant prismatic effect from *decentred lenses*, Vignes²⁷⁴_{Mar.} obtains some valuable tables of values.

The accompanying figure represents a new *ophthalmometer*⁷⁸_{Feb.}



(Annales d'Oculistique.)

constructed by Leroy and Dubois. In many particulars this instrument closely resembles those of Helmholtz, and Javal-Schiötz. Superiority in results and cheapness of instrument is claimed. Calculation is made of the radius of curvature and consequent refractive power of the cornea by study of the size of the corneal image, distance of object and image, and magnitude of the object.

Burnett¹⁹_{Aug. 4} has made *measurements of astigmatism* with the ophthalmometer of Javal-Schiötz in five hundred and seventy-six corneæ, and concludes that in corneal astigmatism the vertical

meridian is, with few exceptions, the most strongly refractive; that many cases of lenticular astigmatism are due to the oblique position of the lens; that the corneal astigmatism expresses in a vast majority of cases the general astigmatism, both as to degree and axis, and therefore this instrument furnishes one of the best means of diagnosing that anomaly; that astigmatism is not more likely to lead to progressive myopia than any other form of ametropia.

By the term *meridional astigmatism*, Jackson⁹_{Oct. 6} purposes to designate the variations of refraction in different parts of the same meridian now known as "normal irregular astigmatism." He recognizes two forms: A positive, in which the greatest hyperopia or least myopia is opposite the centre of the pupil; and a negative, in which the centre is the least hyperopic or most myopic. The recognition of the condition is of value in the testing and the wearing of correcting lenses with undilated pupil.

Plehn²⁴⁹_{Mar.} has been able, by the employment of two convex lenses with arrangements for altering their relative position, not only to replace the entire set of trial glasses, but to supply the equivalent of any imaginable spherical lens, the same holding true correspondingly for a combination of two convex cylindrical lenses. To effect this purpose he has united two plano-convex lenses of five centimetres focal distance with their convex surfaces turned toward one another in a short, telescope-like instrument. By it, he has been able to determine refraction and visual acuteness and the determination of astigmatism. He gives a short theoretical account of its value in connection with the ophthalmoscope.

Javal⁸_{Aug. 30} has modified Helmholtz's ophthalmometer so as to make it much more useful. The mirrors have been replaced by gas-jets, the glass plates by a crystal of double refraction, and the register is increased in size.

Cross,⁴⁶² in speaking of *retinoscopy*, writes: "A method thus based upon sound optical principles cannot but be of great practical value, and it has proved itself an easy, rapid, and precise test in the hands of a large number of oculists." He employs it very largely, and has no confidence in ordering spectacles without it. He believes that it may be fully relied upon, and without atropine, even for the detection of slight errors of ametropia, where subjective testing alone may be very misleading. Baker⁴⁶² gives some

practical points in its use, and believes that its advantages are many: it does not require any expensive apparatus; it is easy of execution; it saves valuable time; cases which formerly took from one to a dozen tedious sittings are disposed of usually in one sitting of short duration; and errors of refraction can be examined and corrected without the assistance of the patient. Burnett,⁹ in his most interesting account of *skiascopy*, gives the following valuable conclusion: It has been called a simple method of testing the refraction, and so it is; but, simple as it is, it cannot be mastered without painstaking care as to the smaller details; and considerable experience is necessary before it can be executed with the rapidity and certainty of which it is capable, and which are among its recommendations to the practitioner. It will not supplant all other means of determining refraction, but it is certainly scientific, and by care and patient practice can be made as reliable as any.

Dr. Landolt (corresponding editor) gives us in detail the method of *designating the meridians of the astigmatic eye*, as well as the direction of the axes of the correcting cylinder lenses. He writes that it has not ceased to be a subject of discussion. At the French Ophthalmological Congress of 1887, two opposing principles were advocated: that of *asymmetric notation*, upheld by Javal, and that of *symmetrical notation*, upheld by Landolt. The former proposes placing the zero point of graduation at the right extremities of both eyes (on the temporal side for the right and on the nasal side for the left), so that the ninety-degree point would be below and the one-hundred-and-eighty-degree point on the left. For the designation of the cylinder glasses, however, he would place the zero point above, the ninety-degree point on the right, and the one-hundred-and-eighty-degree point on the lower extremity of the vertical meridian. Landolt proposes the adoption of the method recognized by the Utrecht school and represented by the test-types of Snellen—zero point above ninety degrees on either side. Here the graduation is the same for each eye, and for the astigmatic eye as well as for the axes of the correcting cylinder. The side toward which the axis inclines is indicated by *t.* (temporal) when the axis inclines toward the temple, and by *n.* (nasal) when the axis inclines toward the nose. Thus, the number of degrees of inclination never exceeds ninety. This is an advantage, because one comprehends easily the angles less than the right angles,

whereas it takes a moment of reflection and a mental subtraction when the number of degrees exceeds ninety. Moreover, this method at once shows the symmetry or want of symmetry between the principal meridians in both eyes. This method, however, is far from being new; it is that of Airy. Donders, in his classical work, has used it. Most of the manuals, for instance, Graefe and Sæmisch, Michel, Schmidt-Rimpler, Meyer, Mauthner, Hock, Schweigger, de Wecker and Landolt, and many others have adopted it. It has been highly recommended by Snellen and by Knapp, the latter praising it again at the last International Ophthalmological Congress in Heidelberg. In France and Italy this method is much used, and even more generally in Russia, Switzerland, and Germany. In Holland it is the only one employed.

Dabney⁵⁹_{Sept. 15} writes that he has used hydrobromate of homatropine for determining errors of refraction, but that it does not always give satisfactory results. He writes of three cases in which he had to re-examine the patients under atropia, and had obtained different and more positive results.

In the "Determination and Treatment of Hyperopia," Coleman¹¹⁵_{July} asks these three questions:—

"1. Is it necessary to paralyze the accommodation in order to prescribe the most suitable glasses?"

"2. Can the accommodation be completely paralyzed by homatropine?"

"3. How much of the hyperopia should be corrected with glasses?"

To which he gives the following answers:—

To the first question, Yes. To the second, No. To the third, from .5 to 1 D less than the total, if the glasses are to be worn constantly, and the total if they are to be worn for near vision only.

In hyperopia, Culbertson³⁴⁷_{Mar.} advises the removal of the punctum proximum and the giving of greater correction. This he has found to be both practical and successful.

Bruns³⁴⁷_{June} lays down a hard and fast rule, that all errors of refraction occurring in patients under fifty or sixty years of age should be corrected by the use of a mydriatic. The second formula, that the whole error of refraction revealed by the mydriatic should be corrected, he judiciously modifies in certain cases of high hypermetropia and myopia with presbyopia.

From long experience, Chisholm¹⁹_{June 2} formulates the statement that the correction of 0.25 D cylinder is in practice the most valuable, basing this assertion upon the fact that many eyes possessing a vision of $\frac{2}{20}$ are not only rendered painful and useless upon account of low degrees of astigmatism, but actually produce great irritation and reflex annoyances, which may be mistaken for other organic diseases and remain uncured until after proper correction of the optical error.

Webster³⁴⁷_{Sept.} reports a case of insufficiency of the interni with progressive myopia, occurring in the practice of Dr. Agnew, in which a tenotomy of the right internus caused "binocular single vision for all distances."

Zehender's case³⁵³_{Oct.} of astigmatic correction by the oblique placing of a spherical lens is another interesting instance of the repetition of ophthalmological history. He, however, goes further in advising, for many reasons, that lenses intended for near work should be inclined to overcome any astigmatism which might appear at the desired angle of convergence.

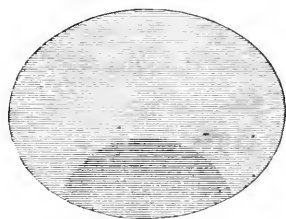
Fick,²⁵⁴_{Mar.} after a series of experiments, has been able to correct irregular corneal astigmatism by means of a small shell of glass with a curvature equal to a normal cornea. This is to be placed in contact with the human cornea and the intervening space filled with a sterilized solution of grape-sugar. The patients experimented upon have been able to wear the lens for several hours without suffering any inconvenience from clouding or irritation. Pursuing the thought further, any desired curvature might be given to the lens, which would then enable it at least to theoretically correct any kind of refraction error, or even accommodative fault. At present we doubt its practical efficacy and would only employ it, if at all, in irregular corneal astigmatism and high degrees of conical cornea.

Kalt¹⁰_{Mar.} also gives a somewhat similar optical treatment for keratoconus.

Fieuzal⁴¹⁴_{June} reports several cases of the radical treatment of keratoconus with more or less favorable results.

Culbertson³⁴⁷_{May} has found a number of cases in which, after absolute correction of monocular astigmatism, there has been imperfect binocular near vision, requiring a change of the axis of the correcting cylinder for such work. This he attributes to a want

of combined harmonious action in the interni, inferior obliqui, and superior and inferior recti muscles; this fault causing a twist in the corrected defective corneal meridian, and necessitating a corresponding twist in the position of the cylinder correction. Savage³⁴⁷_{Sept.} writes, in criticism of this statement: "I would say that the acting extrinsic muscles of the eyes in near vision are the interni, inferior recti, and the superior oblique, the interni causing the visual axes to converge, the inferior recti causing those axes to point downward toward the page, and the superior oblique preventing the loss of parallelism between the vertical meridian of the cornea, which would occur if the inferior recti were unopposed in their action. In proximal vision only these muscles act except in certain cases of astigmatism where, for the betterment of vision, the superior oblique of one eye is made to



GOULD'S EYE-GLASS.
(Med. and Surg. Rep.)

act too powerfully, rendering it unnecessary for the inferior oblique of the opposite eye to act correspondingly, in order to prevent double vision. *The naturally vertical meridian must be kept parallel if not vertical, else double vision would result.*" Richey²³¹_{July} while agreeing with Culbertson as to the frequency of this condition, thinks that the cause may be more

satisfactorily sought by a mental environment, as it were, to the faulty working of an imperfect peripheral visual apparatus, which persists even after the correction of the error.

Alt⁸²_{Feb. 25} sees no objection to the use of pebbles provided that weak lenses are needed, the eyes are not sensitive to light, and the patient willing to pay higher prices.

In the arrangement of the ordinary bifocal lens, Gould¹⁹_{Nov. 3} advocates a plan of reversing the position of the crescentic or semi-circular near lens, so that the bulk of the whole lens will be kept for distant vision, as in figure. The small additional area is fastened by means of Canada balsam.

Gould¹⁹_{Sept. 29} calls attention to the influence of refraction errors upon developing character and vocation in life. The subtle influence of even slight eye-strain may in the young work deleteriously upon disposition and the mental life, or slowly turn them from occupations otherwise chosen. Examples are given.

Pavinaud, ¹⁷³_{Dec. 18, '87} in an article on ocular cephalalgia, divides into (a) ocular, which he subdivides into muscular and accommodative asthenopia, and (b) neuro-ocular, which embraces all causes independent of the eye. The neuralgia is frontal, localized at two distinct points of the brows, and is increased by the use of the eyes. He finds it necessary not only to correct any existing error of refraction, but to give complete ocular rest and improve the tone of the general system.

Dr. Landolt writes us that "Astigmatism, which for a long time was neglected in this country, has during the last few years assumed such a preponderance in the imagination of many practitioners that there will soon be no disease of the eye in which astigmatism will not be accused of playing a part. Already asthenopia of all kinds, myopia, strabismus, a special form of keratitis, cataract, detachment of the retina, etc., are attributed to it. Bettremieux ²⁷⁴_{p. 513, '87} has revealed to us the existence of an astigmatic mydriasis and of an astigmatic blepharospasmus. The assumption of the latter is not illogical, as the observations of the author, who has seen blepharospasmus cured by cylindrical glasses, prove the correctness thereof."

Under the title of "Ophthalmic Migraine and Astigmatism," Georges Martin ¹⁷_{Apr.} continues his valuable studies. Based upon twenty observations, he deduces the fact that bilateral migraine always is the greater on the same side as the stronger contraction of the ciliary muscle, and that relief is afforded by the use of the ciliary lenses. Six cases of migraine were met with in the practice of Percy Jakins, ¹⁵_{Mar.} five of which showed hypermetropia from one to two D, and one myopia 2.25 D. Correction of the refractive error was followed by absolute cure in every case. Dufour ¹⁹⁷_{Apr. 20} also gives four examples of the same condition following operative procedure. His third case underwent marked amelioration by the use of the correcting sphero-cylinder lens. He cites a number of instances occurring both in affected and untouched eyes.

Goode, ⁵³_{Nov. 17} in an article on headache due to disorders of vision, believes "that the increase in the number of spectacles worn is not to be regarded as an evidence of modern degeneration of the eyes, and threatened further alterations unless we called a halt in some of our ways, but rather that a long-felt necessity has been met."

Stevens' essay¹¹¹⁶ on "The Maladies of Nervous Centres: Their Causes and Their Treatment," treats more particularly of epilepsy, chorea, and the other various so-called functional neuropathies. Refractive error and improper muscle balance were both found to act as peripheral exciters, the correction of which caused rapid disappearance or amelioration of distressing symptoms.

SECTION III.

SPECIAL DISEASES.

DISEASES OF THE LIDS.—A curious *anomaly*³⁵³_{May} of the motility of the lids and eyes of a forty-year-old nun, in which the eyelids widely opened and the globes became more prominent during each successive act of the muscles in eating, has been noted by Adamük. He attributes the phenomenon to venous stasis produced by compression during exercise of the muscles of mastication. A *congenital cyst*⁷⁰¹_{May, June} the size of a plum, beneath the left lower eyelid, with absence of the left eyeball, occurring in a girl ten years old, was removed by Winawer. There were colobomata irides et choroidæ and involvement of the optic nerve on the left side, with microphthalmus of the right. Microscopic examination showed that the cyst-wall consisted of two layers, the outer one being fibrous in character, the inner filled with pigment-granules and blood-corpuscles. A case of *fugitive œdema of the eyelids*²_{May 12} of six months' duration, occurring in a Sister of Mercy aged forty-six years, is reported by Tom Robinson. She had had erysipelas of the face and head, with puffiness of the face, and was frequently troubled with headache. There was no indication of organic disease of heart or kidneys. Under the same title, de Schweinitz³⁴⁷_{June} contributes a case in which the right side is alone affected, each attack being preceded by "severe head pains" located in the distribution of the corresponding supraorbital nerve. Basham's mixture, iodide of potash, salicylate of soda, with local use of hot stupes and fly-blisters, relieved the œdema, but proved of no avail in subduing the neuralgia. Sédan,¹⁷³_{May} having read of Verneuil's use of carbolic acid by atomization in the treatment of furuncle and anthrax, has tested its efficacy in blepharitis ciliaris and other diseases of the eyelids with some success. He employs a decoction of it with coca leaves for several minutes every half hour. Half-

grain doses of sulphide of calcium in pill form two or three times a day after meals has, in Simpson's practice,²_{Nov.23} been found an admirable preventive for *styes*.

Ray³⁴⁷_{Sept.} has modified the *operation for removal of chalaza* after the method of Agnew, by first finding the opening of the involved meibomian gland by expressing some of the contents at the mouth of the duct. Having done this, he forces a few drops of a 4 per cent. solution of cocaine into the mouth of the duct and presses the solution into the substance of the tissues, following this by instillation of the cocaine upon the eye itself, so as to allay irritation from handling. He grasps the tumor between the fingers and makes an incision with a Gräfe knife along the lid margin, following the course taken by the hypodermic needle. An incision twice the width of the knife-blade is now made into the substance of the tumor, and the contents thoroughly broken up and removed by a small sharp-edged curette. The cavity is irrigated with a mercuric chloride (1-2000). Hot bichloride solution as a wash for a few days removes every trace of the original protrusion. When the growth is in the lower lid a small counter-opening is made below in the conjunctival surface for purposes of drainage.

Chisholm²⁴⁹_{June} reports a case of *varicose tumor of the left lower lid* occurring in a man aged fifty-nine years. It is not visible when the head is erect, but when the head is placed horizontally or when the patient stoops a bluish tumor appears, the size of a small fowl's egg, encroaching on the palpebral fissure. Operation for its removal consisted in the introduction of a seton, and several days later the opposing walls of the sac were clasped together by means of three double sutures tied over a roll of sponge. In *trichiasis of the upper lid*, Hotz³⁵³_{Mar.} replaces the lid margin by removing a wedge-shaped piece of tarsus just above the roots of the eyelashes, the two free surfaces being at right angles to each other. The two outer edges of the cut are brought together by sutures, and it will then be found that the ciliary border of the lid will be much better everted than in the ordinary method of operation. Although regarding Hotz's operation as the best and most rational procedure in use, Allport³⁴⁷_{Mar.} employs a method by which he obtains most excellent results in the simpler forms of entropion. Five horizontal loop sutures, each two lines in width and two lines apart, extending through the entire thickness of the lid just above

the root bulbs, are to be made, and the lid dressed in the ordinary way. Inflammatory reaction should not be subdued unless too severe. The loops are to be removed in from seven to ten days.

J. B. Taylor¹²¹_{Mar.} gives a detailed account of the use of *electrolysis* for ingrowing eyelashes. He states that he has obtained excellent results by its use, and that the cure is permanent and without disfigurement. An obstinate case of *trichiasis* and *entropion* has been operated upon by C. Bell Taylor,²_{July} in the following manner: A perpendicular incision at each extremity of the lid is made and the lid is everted. The two incisions are connected by a deep cut on the inside right down to the cuticle, just within the roots of the lashes, as in Burrow's operation. A piece of skin is taken from the upper lid, and, after retaining a broad pedicle, is transplanted into the wound thus made. The approximation of the edges of the gap in the upper lid by sutures everts the lashes, and the transplanted skin effectually prevents any return to their abnormal situation.

In the *treatment of entropion*, Pitts⁴⁶² calls attention to the simplifying and ameliorating effects of the process of electrolysis in permanently removing any displaced cilia, and in the further effect of reducing the thickened, hypertrophied tissue usually present, thus relieving the cornea from the presence of the irritation of the displaced eyelashes, and in reducing the hypertrophied lid tissue, overcoming often the tendency to entropion." He says that "such treatment, in a great number of cases, will afford entire relief." Landolt²⁷⁴_{V.1,p.9,11; V.3,p.193; V.5,p.467} describes a case of *plastic operation of the lower and outer part of the upper eyelid*, which had to be removed because of cancer. He replaced the lost lid by a large flap taken from the temple and the cheek. The loss of substance, which could only partially be repaired by the surrounding skin, was covered by wide layers of skin taken from the thigh of the patient, according to Thiersch's method. Thin layers, comprising the epidermis and stratum Malpighi only, were put on the wound on the second day and kept there four days under an antiseptic bandage (corrosive sublimate 1-5000). They all took perfectly, and even the difference in height between the grafted part and the neighboring skin disappeared in a very short time.

Van Millingen,²⁷¹_{Jan., Feb.} still supports his operation for the radical cure of trichiasis. The forty-eight cases that he has operated on

since 1885 have all done well. He considers all methods hitherto employed in cases of trachoma insufficient, because they do not increase the depth of the shortened conjunctival sac. In a case of entropion of the lower lid, with other marked sequelæ from granular conjunctivitis, Noyes¹⁰⁷⁰ made the following procedure in addition to ordinary operation of cantholysis. He says: "At a distance of a fourth of an inch from its edge, I dissected up a narrow strip of skin nearly the full length of the lower lid and four to five millimetres wide. This piece of skin was left attached at its temporal extremity, and the wound closed by suture; one-half of the piece was cut off, the edge of the lower lid was denuded for a short space very near the outer canthus, and upon this spot the flap of skin was attached by one or more sutures, bridging over the intervening healthy integument. It acted like a piece of tape or sticking-plaster to draw out the ciliary border of the lid. In two or three days the sutures were removed, and the patient soon after ceased attendance. Four years after the operation the patient returned. The band of skin still adhered to the lower lid and drew it down. It was severed from its connection at each end, and the lid retained a normal position. There is no irregularity of the border. The deformity has been cured." He believes that without doubt the result was secured within a few weeks after the operation, and thinks for peculiarly obstinate cases the proceeding promises to be hopeful. Thiersch's method of transplantation for cicatricial ectropion has been successfully practiced in one case,²⁸²_{Sept.} and with partial benefit in the second, by Buller. Strict antiseptics was employed with iodoform dressing. A few months will be allowed to elapse before the bands of adhesion between the two lids are separated. Boucheron⁷³_{No. 12} describes, under the name "*tarsectomy*," an operation for senile ectropion in the early stage. It consists in excision of a portion of the tarsal cartilage from the conjunctival side. One dozen cases operated on by him have given perfectly satisfactory results. Gayet¹⁷¹_{Mar., Apr., May} uses the *galvano-cantery* to obtain cicatricial subcutaneous tracts in *ptosis*. For *symblepharon* de Lapersonne recommends an operation which Landolt writes to us that he has used for a long time without publishing it, as he did not consider it new. The conjunctiva of the symblepharon is very carefully dissected from the cornea up to the free edge of the lid. A thread with two needles is passed through the head of this flap, the needles

are passed through the lid about ten millimetres from the edge, and the threads knotted over a roll of antiseptic cotton. The lateral edges of the symblepharon—in other words, the edges of the wound caused by its removal—are loosened with the scissors and sewed together. Grossman, of Buda-Pesth,²⁴⁹_{Sept.} has had most excellent success with *Boch's method of transplantation* in a case of supposed cancerous ulcer. The graft was taken from the arm. Koller³_{Oct.6} speaks of a *reflex blepharospasm* resulting from or being kept up by a small fissure near the canthi, generally the outer one. Cauterization with sulphate of copper followed by application of yellow oxide of mercury generally suffice to effect a cure. Dehenne¹⁷_{p.712} recommends section of the supraorbital nerve in *tonic blepharospasm*. A case of *primary syphilitic sore on the upper eyelid* in a boy aged six years is reported³⁶_{Sept.} by Mackay. A papular eruption appeared six weeks after the initial lesion. There was very good proof of contagion from an infected mother.

DISEASES OF THE ORBIT.—*Orbital aneurism from traumatism*, in which vision was lost, associated with marked bruit over the entire head, occurring in a boy, is described²_{Jan.28} by Morrison.

A case of *pulsating exophthalmos* cured by ligation of the carotid is reported⁶¹_{Aug.4} by Buller. Two weeks after a traumatism, a right pulsatory proptosis with deviation of the eye appeared. Bruit could be distinctly felt and heard. Ligation of right upper carotid resulted in softening of the swelling, partial replacement of the globe, lessening in the pulsation, and disappearance of the bruit. Kipp⁶¹_{Aug.4} reports a most interesting case of *pulsating exophthalmos* more marked on the right side, which rapidly disappeared by compression upon the right carotid, and the internal administration of iodide of potassium. A case of *acute exophthalmos* after exposure to cold rain is reported⁹_{Apr.28} by Day. The eye protruded one-half to three-fourths of an inch. The pupil was dilated. The media are described as clear, but no ophthalmoscopic description of the fundus is given, nor any note of the degree of vision. The treatment consisted in the use of purgatives and tonics. A blister was applied back of the ear, and a collyrium of the sulphates of atropia, morphia, and zinc were instilled into the eye. In two months, the eye had receded to its normal position, and vision, as far as the observer could judge, was unimpaired. The case did not present any affection of the thyroid gland, heart failure, anæmia, or

chlorosis. Day considers the lesion to have been a congestion of the vessels and perhaps infiltration of serum or blood in the post-orbital tissues. A case of deep *phlegmon of the orbit* attacking an infant nineteen days old is reported²²⁰_{Feb.} by Dujardin. The abscess was first emptied by puncture with a bistoury, but was subsequently cured by spontaneous discharge through the mouth and nostrils. At the time of birth, the mother noticed a small swelling on the lower lid, which disappeared, leaving a minute scar. The author remarks upon the possibility of the entrance of microbes from the maternal secretions into the child's tissues through the lesion of the skin. The mother was not suffering from gonorrhœa. He mentions another case of deep orbital phlegmon which discharged through the mouth and nostril, occurring in a little girl in whom electrolysis for intraorbital tumor had been tried. Surmount¹⁸¹_{July} cites a similar case in an adult.

Terrier²⁷⁴_{Mar., Apr.} gives two cases of *orbital abscess*. The first, which was quite deep, most probably resulted from an osteo-periostitis caused by a severe blow upon the anterior portion of the skull fifteen years previously. In the second case, a small abscess in the left frontal region seems to have been caused by inoculation through the finger of the patient, a superficial abscess of the inner canthus of the right eye, which sank deeply within the orbit. The latter case showed changes in the anterior portion of the eye, the possible result of exophthalmos. Peltesohn¹⁹⁰_{Feb.} describes three cases of *abscess of the frontal sinuses and orbits*. The first two occurred in young women of eighteen and twenty-two years respectively, while the third was found in a man of thirty-one years. In each case evacuation of pus was followed by prompt recovery. Panas⁷³_{Dec. '87} gives a description of a case of *suppurative periostitis of the orbital walls* following disease in the frontal sinuses. Under chloroform, a drainage channel was established which produced rapid subsidence of the swelling. A. D. Williams, of St. Louis,¹⁰⁹_{June} considers the diagnosis of periostitis of the orbit comparatively easy. Its development, as a rule, is sudden. The best method of determining its character is by palpation. Treatment consists in the free use of the iodide of potassium. Chambers¹⁹⁹_{June} gives illustrations of a case of *epithelioma of the orbit* of five years' standing. The eye was removed three years after the appearance of the growth. The neoplasm, which had involved the entire orbit and

had extended into the anterior nares, was removed by electrolysis. Rodman's account²²⁴_{Sept.1} of a *subdural cyst of the left orbit* occurring in a lad of fifteen years is of value. At eight years of age the child was kicked under the left eye, to which the writer attaches no etiological importance. At the time of examination there was a tense fluctuating swelling in the suborbital region, with proptosis. The eye was enucleated and the tumor dissected back away from the periosteum of the orbital roof. Examination showed that the inner wall of the orbit was absent. The cyst-wall was incised, giving egress to about four ounces of a brown, gelatinous, viscid material. Upon removal of the cyst-wall, the brain could be distinctly seen and felt pulsating, being covered only by the pia mater. To prevent hernia cerebri, the eyelids were closed and the orbit was allowed to fill with blood. After a continuous increased temperature, with evening exacerbation for seven days, the temperature became practically normal. In conclusion he says: "I take this cyst to have been a subdural one, and think it possibly began at the sphenoid fissure or optic foramen, as a prolongation of the dura mater extending from the cranial cavity through these and other foramina at the base of the skull." Knapp²⁴⁹_{Mar.} reports a case of *small orbital osteoma* successfully removed with the chisel, occurring in a boy of thirteen years. The growth was readily removed by a few strokes without breaking into the frontal sinus. The cavity was washed out with an alcoholic solution of biniodide of mercury and closed with a continuous silk suture. Gauze and absorbent cotton and a flannel bandage were placed over the wound. Antisepsis was strictly adhered to throughout the procedure. Primary union soon took place. Grossman⁷⁶_{Dec. 97} details a very interesting case of *ivory exostosis of the orbit*, which was removed by drilling a series of long holes close together throughout the whole base of the tumor, and breaking down the intervening septa by lateral borings. The wound was closed and a small drainage tube inserted. The patient left the hospital on the twelfth day, the eye resuming its normal position in seven to eight weeks' time after the operation. No return could be noticed after one year's duration. A case of *exostosis of the orbit*, causing extreme proptosis of the left eyeball, with which was associated cerebral tumor of myxomatous character, has been described²_{Mar. 24} by Peter Yates. A case of partial *simple hyperostosis of the*

frontal bone has been removed²_{Oct. 27} by Silcock. Weis¹⁸⁴_{Dec. 1, '87} reports a case of *exostosis occupying the internal wall of the orbit*, which began on a level with the ethmoidal bone, toward the inferior internal angle of the orbital cavity, and ran through the muscles and below the optic nerve. The tumor was removed without injury to the eye. It was three centimetres long, one centimetre wide, and weighed three grammes. A *tumor of the supraorbital region* extending into the roof of the orbit, the size of a pigeon's egg, has been successfully removed²⁰⁶_{Feb.} by Jagat Chundra das Goopta. A case of slow-growing, unencapsuled, round-celled *sarcoma of the orbit*, originating in the region of the right lachrymal gland in a man thirty-five years of age, is reported²¹³_{Apr.} by Thomas Reid and Henry E. Clark. When first seen, there was considerable exophthalmos and œdema of conjunctiva and eyelids. It is noted that the left eye has been blind for about nine years, and no assignable cause is given. As the patient had to depend upon the right eye, portions of the tumor were removed at intervals of three and six months. In one year the growth had steadily increased in size, until it reached as far back as the posterior level of the right pinna. Electrolysis was tried, but without any perceptible decrease in the mass. The case is interesting because, notwithstanding the exophthalmos, the patient had been able to read No. 6 Jaeger type up to the time of the report. Four cases of *orbital sarcoma* in children are reported by Lawford,⁴²³_{V. 12, part 1} each accompanied by a careful microscopical examination. The first, which was observed in a subject four years old, consisted (in the original growth and the recurrent structure two years later) mostly of oval, spindle-shaped cells with areas indicative of genuine fibroma. In a third recurrence, six weeks afterward, there was an alteration in which the cellular elements had diminished, and the blood supply had become less abundant—evidence, according to the author, of the appearance of a more rapidly growing tumor of a lower type than the first two growths. The second occurred in a female, aged ten years, with one recurrence three months after the primary operation. In both specimens, a partially encapsuled, unpigmented, round-celled sarcoma was found. In the second specimen, the cells were less directly packed and grouped, the vascular supply was lessened, and the capsule seemed stronger. The third case, which seemed to be traumatic in origin and was only one month in duration, occurred

in a ten-year-old male. The growth proved to be an unencapsuled, unpigmented sarcoma growing in the connective tissue of the orbit. The fourth, a round-celled sarcoma, unpigmented and unencapsuled, was found in the right orbit of a female, aged ten years, in whom six weeks after the operation there appeared a new growth in the right temporal region, followed six days later by unconsciousness, epileptiform fits, sometimes unilateral, headache, and vomiting. The patient died in five weeks' time. Profound intracranial changes indicative of new growths with resultant inflammation were found post-mortem. A case of rapidly growing *sarcoma of the frontal bone*, involving the orbit, in a twelve-year-old patient is described²¹³_{Aug.} by Thomas Reid. Ophthalmoscopic examination revealed acute inflammation of both optic nerve-endings, the retinal veins being greatly swollen. A *myxomata of the orbit with colloid degeneration* in a colored woman, sixty-nine years of age, has been successfully removed²⁰⁷_{Nov.} by Bullard. A rapidly recurrent orbital *gliosarcoma* occurring in a two-year-old child is reported²³³_{Aug.} by Wright. An interesting coincidence is that a cousin of this child on the father's side died a few years before under similar circumstances. A supposed case of *melanotic sarcoma of the orbit* in a sixty-year-old patient is reported by Fieuzal.⁴¹⁴_{Mar., Apr.} The growth, with the entire contents of the orbit, were removed.

A successful case of *resection of the infraorbital nerve* for the cure of neuralgia has been reported by Ozenne²⁴_{Nov. 18} in a female, aged fifty-three years, who after exposure to cold two years previously, had been suffering from recurrent localized pain situated in the right cheek, following the slightest irritation. During these attacks, a sense of constriction near the right *alae nasi*, followed by a convulsive contraction of the right orbicularis and the facial muscles of the right side came on, after which the surface over the attacked muscles became decidedly reddened. No other symptoms of any kind whatever were observed. After resection of some eight to ten millimetres of the trunk of the nerve, the pain gradually left, until in eight months' time she was entirely free. Microscopic examination of the resected portion showed the results of interstitial inflammation.

Phillips,⁶_{June 2} publishes a remarkable case of masses of *encapsulated shot* which had remained embedded in an orbit for fourteen years, death occurring from arachnitis.

Reeve³⁹_{Sept.} gives two interesting cases, one of *periostitis and caries* of the outer half of the upper margin of the *orbit*, and the other of secondary invasion of the *orbit by sarcomatous growth*.

William F. Smith's rare case²⁴⁹_{Mar.} of *diffuse hyperostosis of the greater wing of the sphenoid* in a female of forty-nine years of age is of great interest. Its surface was even and appeared diffuse. He thinks that it can hardly be classed among the exostoses, but that it belongs rather to the diffuse hypertrophies, which, when affecting all the bones of the cranium and face, produce the so-called *leontiasis ossea* of Virchow. The case was traumatic and developed from the periosteum. It differs from osteomas in that it was not very hard, that it was not enveloped by mucous membrane, and that it had no connection with any sinus.

DISEASES OF THE LACHRYMAL APPARATUS.—C. Bell Taylor²_{July 21} has devised a knife by which *steuosis of the lachrymal duct* can be dilated without slitting the punctum. It is made on the principle of the Weber knife, but has quite a short terminal blade.

Based upon the value of the retention of the punctum and lumen of the canal, Steavenson and Jessop²_{Dec. 24, '87} have employed *electrolysis in the treatment of lachrymal obstruction*. Their method is quite expeditious, and can be limited to the exact point of stricture. The results so far obtained in ten cases have been fairly successful, especially those in which "the obstruction was at the punctum or canaliculus, not in the sac itself." A cylindrical grass-blade one-half centimetre long was extracted from the upper canaliculus of a man thirty-five years old by Rodionoff,⁵⁷¹_{No. 8} of Moscow. The foreign body, which had been considered to be a new growth, had remained *in situ* for several weeks and had produced marked symptoms of irritation. Noyes¹⁰⁷⁰₁₈₈₇ reports the *removal of a spontaneously prolapsed lachrymal gland* of eight years' duration. The case differs from all others in the slowness of its production and in the absence of any apparent cause. *Extirpation of the lachrymal gland* for the relief of troublesome epiphora has been practiced¹⁰⁶⁹_{June} in an interesting case reported by A. D. Williams. De Wecker⁸_{Sept. 6} excises the palpebral portion of the lachrymal gland in *persistent lachrymation*. Twenty-five successful results are noted.

In the treatment of chronic dacryocystitis fistula Prince⁴⁶² offers the following device: gold or silver blunt-pointed cannulae perforated upon the lower ends and sides, and crooked at their

upper extremity, each being equal in size to a number eight Bowman's probe. Injections of twenty-five per cent. solution of peroxide of hydrogen can thus be effected by the patient as often as necessary by means of an ordinary irrigating syringe. Their behavior so far has been most satisfactory.

Dolgenkoff ⁷²⁵_{Jan., Feb.} describes a most curious and interesting case of *hypertrophy of the caruncle* with calcareous deposition in the surrounding tissue. It was removed without difficulty. (Report of Dr Maklakoff, of Moscow.)

DISEASES OF THE EXTRAOCULAR MUSCLES. — Tangeman ⁵²_{Apr. 14} gives a short account of the *anatomy, physiology, and pathology of the extraocular muscles*.

Gracfe ⁸_{Aug. 30} seeks two distinct centres for the *innervation of the internal recti muscles*—one for conjugate deviation or associated lateral movements, and the other for convergence and accommodation. He bases his belief upon clinical evidence.

The accompanying *scheme*, devised by Magnus, ³⁵³_{July} is designed *for the diagnosis of the localization of the conditions producing alterations in reflex movements of the pupils*. The article accompanying the original is replete with points for differential diagnosis, and should be most carefully studied to form a distinct and adequate idea of the many variable and related conditions. The numerous forms of associated and uncombined enervations and innervations are gone over and arranged into small captions by which the student is enabled to see, at a moment's glance, what to expect in any ordinary case of muscle change or error. The plate itself has been reproduced for the benefit of those who desire a graphic help in the analysis of the probable situations of lesions productive of visible peripheral change.

Stevens ²⁴⁹_{No. 2, '87} says that at twenty feet "An experience in many thousand examinations leads me to believe that the standard of *normal abduction* should be about eight degrees, and that of *adduction* at about fifty degrees. In respect to this last, however, the ability to overcome prisms equal to fifty degrees implies, in most cases, an ability indefinitely exceeding this, and many who at the first trial can accomplish only one-half of this will, after two or three attempts on different days, succeed in uniting images with the full strength of the adducting prisms. On the other hand, while the failure to overcome at twenty feet a prism

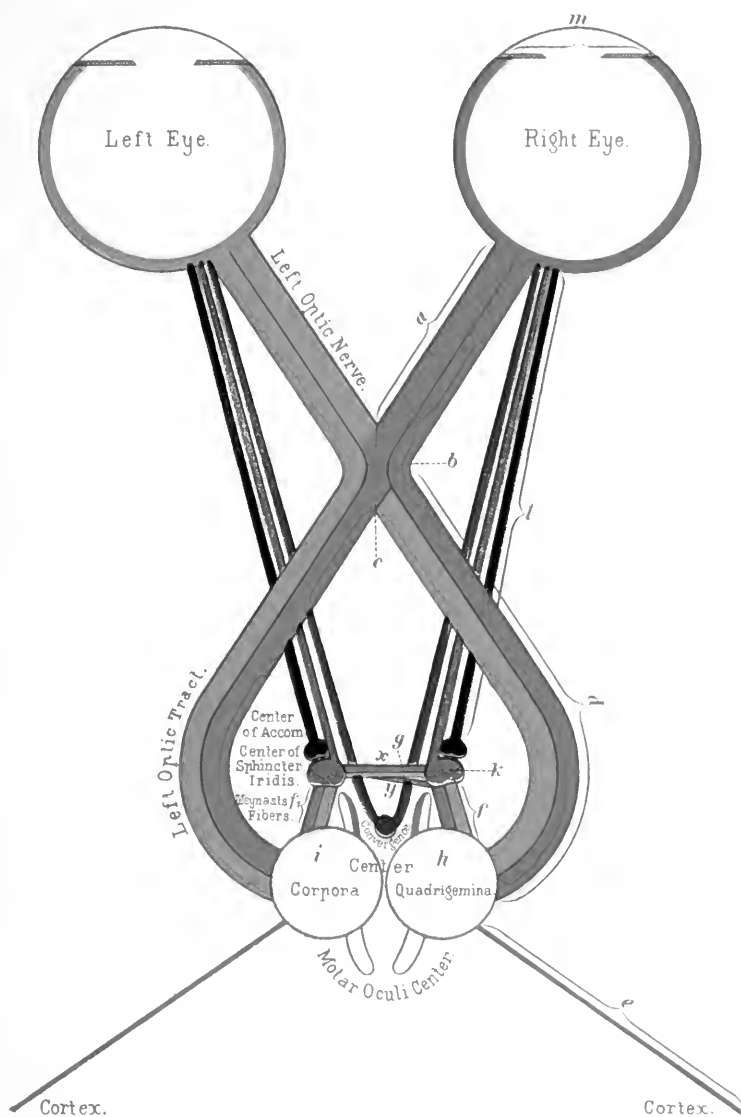
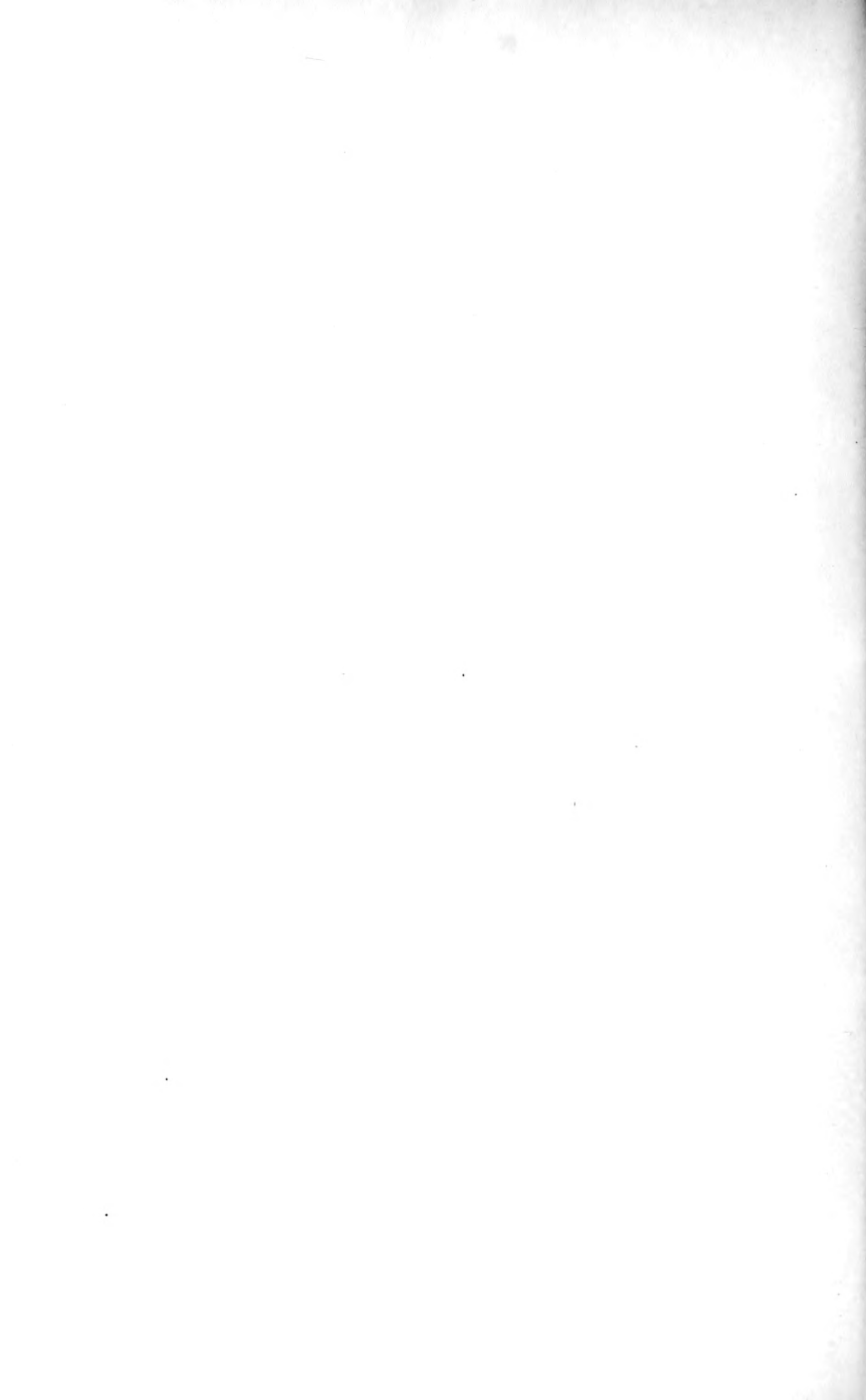


Diagram to illustrate the Semiotic Significance of
Reflex Pupillary Movements.

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of eight degrees with its base in should be regarded as suggesting an excess of energy over the others on the part of the interni, and while power to overcome a higher prism suggests a balance in the opposite direction, many cases occur in which the absence of ability to overcome a prism of five degrees does not prove an inward tendency of the lines, nor does the blending with a prism of ten or twelve degrees prove a tendency outward. The ability to overcome a very strong prism with its base inward may be associated with actual converging strabismus, and the failure to overcome a comparatively weak one may be associated with an outward balance."

A peculiar case of *monocular diplopia*, without manifest lesions of the affected eye, has been seen by Tilley.⁶¹_{Mar.17} No assignable cause could be definitely given.

Swanzy's case²_{Nov.17} of *conjugate lateral deviation* of the eyes, probably due to a congenital lesion, is of interest. He regards the case due to an intrauterine lesion situated in the pons and implicating the nucleus common to the sixth and third nerves on the left side.

Rumford²_{Nov.17} refers to a case where a man had conjugate deviation of the eyes to the right all his life. Post-mortem showed a want of the left-internus and a faulty development of the right internus.

Lillie, of Wilson, Kansas, sends us a small portrait which has been divided vertically and the two sides pasted together to form the central line of the picture. While looking at it with both eyes and at the same time pressing the outside of the eyelid on either side, the face is reunited. It is quite interesting and well worthy of repetition.

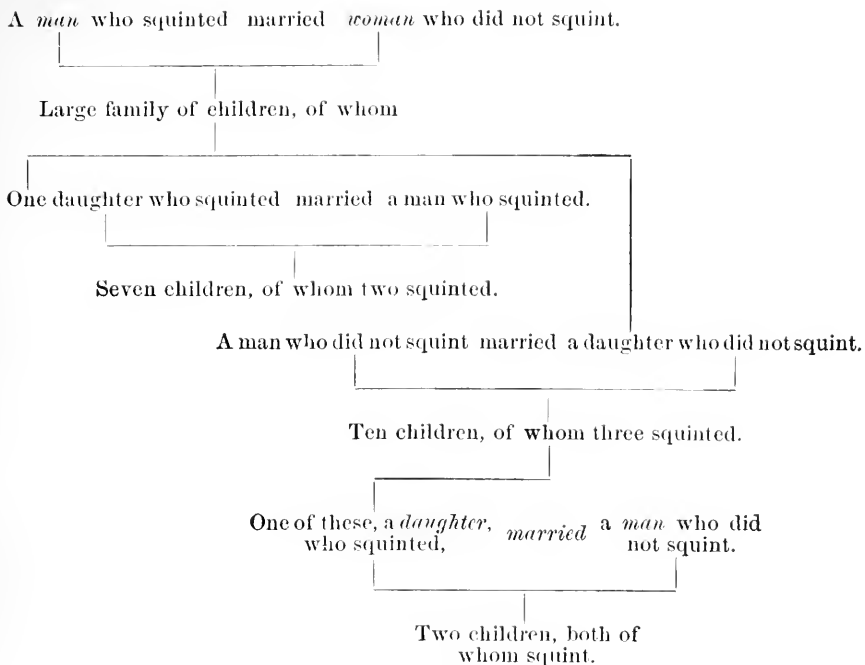
Frost,²_{Apr.14} in speaking of *concomitant convergent squint*, thinks that to Donders we owe the discovery of the connection between hypermetropia and strabismus, and his theory has been universally accepted till recently. Latterly, however, two objections which have been urged against it seem to have shaken the faith of some. One is that, according to it, all hypermetropes should squint; the second is the alleged immunity of the higher degree of hypermetropia from squint. The first he believes to be unreasonable, and the second untrue.

Burnett's valuable studies⁵⁹_{Nov.12,'87} in the comparative frequency

of similar diseases among the whites and negroes still continue. In a recent paper, he finds that *convergent squint* is twelve times more frequent in the former race, and attributes this to the more firmly fixed habits of convergence in near work, which the white man has been doing for generations.

Lang and Barrett¹²³_{Jan} give detailed notes of observations on *convergent strabismus*. They found that of one hundred and two cases in which the full correction glasses were worn, eighty-seven, or 85.3 per cent., were improved, and fifteen, or 14.7 per cent., were not improved. In twenty-five, or 29.4 per cent., the improvement lasted only while the glasses were worn, and in sixty, or 70.6 per cent., the improvement was permanent. Those cases under ten years of age proved more amenable to this treatment. They state that the longer the glasses were worn, the greater were the beneficial results. From these studies they concluded that rapid and complete cure was effected in 10 per cent. of all cases by the use of glasses, but in 33 per cent. the cure continued only as long as the glasses were worn, but would probably become permanent in course of time, the effect of this treatment being in direct ratio to the youth of the patient. They further think that spectacle treatment should, therefore, in the great majority of cases, serve as an indispensable preliminary adjunct to operative treatment. The possibility of producing operative divergence is also avoided. If the spectacle treatment fails to produce absolute cure, a division of the internal rectus generally suffices, with the use of glasses, to remedy the deformity. In some few cases the opposite internal rectus must be subsequently divided.

In continuing their studies¹²³_{July} they first take up the possibility of alteration of vision in the squinting eye, and conclude that there is no definite evidence to show that valuable improvement of vision in the amblyopic eye ever takes place under any circumstances, and that in cases of concomitant convergent strabismus treatment is of value chiefly for cosmetic purposes. Their next endeavors were directed to the possibility of hereditary transmission, and they found that, although in most cases it can be negative, yet in a fair number the evidence seemed reasonably conclusive. They give the following table as convincing evidence:—



They think that the singular interest of this case is not that the squint is transmitted, but that there is a liability to develop it through special conformation and peculiar, exciting circumstances. The next question, as to whether the squint is the result of congenital amblyopia, is, in the main, answered in the negative. The question as to the first appearance of the squint showed that the average age of the majority of cases was three and one-third years. In one-sixth of the cases it appeared in the first year of life, another one-sixth manifesting themselves later than the fifth year and three cases beyond the tenth year; from which they formulate the following conclusions: (1) That good vision in the squinting eye is retained usually in cases of strabismus in which the disease appears later in life than usual, *i.e.*, after the fifth year; (2) that many of the cases which begin late in life are cases of alternating strabismus, in which excellent vision exists in each eye; (3) that in a fair number of these cases of late origin the extinction of vision by nebulae seems to cause the strabismus to appear. Various causes, more especially pertussis, teething, and measles, were assigned by the patients or friends. The next question, whether amblyopia is the cause or the consequence of strabismus, is

answered by them that in the great majority of cases the amblyopia is produced as a consequence of the squint, but that in a minority of cases, where amblyopia is probably congenital, this condition may probably determine the development of the strabismus. They also say that the amblyopia is not due to the deterioration of vision, but to a failure of development; that is, to a failure to educate the visual sense at the time of life when education is possible (when the sense in the other eye is being acquired). They agree in the belief that the existence of hyperopia is almost essential for the development of squint, yet think it probable that diseases such as pertussis may determine the development of strabismus, and promise the consideration of "a further something" which determines its presence. "That this something is transmissible seems probable from the record of our cases." They consider that the use of atropine in concomitant convergent strabismus produces a considerable diminution of the angle of divergence in a fair number of cases, but that in the majority of cases it fails to do so, and in some instances produces an increase in the angle.

Following tenotomy of the internus, *hemorrhagic extravasation into Tenon's capsule*, followed by exophthalmos, dilated pupil, irresponsive iris, diminished vision, and pallor of the disk, has been noted by Emrys-Jones. The case rapidly improved after the employment of a compress bandage.

Landolt⁴⁶² insists on the importance of combining an *orthopedic treatment* with an operation for strabismus. His views on this question are to be found in a concise form in the official report made by him to the International Congress for Ophthalmology at Heidelberg.

In his own words: "Before beginning the treatment of strabismus, a very careful examination of the patient should be made. This examination must take into account not only the age, general condition, personal and hereditary antecedents of the individual, but also the conformation of the orbit, the refraction, accommodation—absolute and relative—and the visual acuity. It is also important to ascertain the duration and the form of the affection (periodical or constant, alternating or monocular). The amount of strabismus must be determined in degrees and the angle of apparent deviation be distinguished from the angle of real strabismus

(angle kappa). The determination of the field of fixation (and, if possible, of the amplitude of convergence), while giving us an insight into the condition of the ocular muscles, and the examination of diplopia and the power of fixing double images, while giving us an insight into binocular vision, teaches us the indications for treatment and enables us to choose the most efficacious methods. If the strabismus is of short standing, it can be treated with the stereoscopic exercises of Javal. The orthoptic methods are in general very praiseworthy, especially for improving the results obtained by the surgical treatment. In convergent strabismus due to anomalies of accommodation, resting the eyes, mydriatics, and convex lenses (if necessary, a stimulating treatment) are indicated. According to Alrich, the use of eserine also gives good results. Only when the pacific treatment has effected as much as one has a right to expect should recourse be had to any operation. Tenotomy is indicated if the strabismus is not very high and if the muscles are not weakened, the amount of strabismus and the effect expected determining whether tenotomy is to be performed on one or both eyes. In the latter case a sufficiently long interval must intervene between the two operations. As regards the stitches recommended to heighten the effect of the tenotomy by drawing the eye to the opposite side, they should be abandoned, as they pull the eye to a certain extent out of its muscular funnel and diminish excursions in both directions. A moderate tenotomy, on the contrary, increases the action of the antagonist as well as of the detached muscle. This fact is established by the field of fixation and the amplitude of convergence examined before and after the operation. The explanation for this is given before, assuming that the weakening of the muscles is due to its solid insertion in the eyeball rather than to the setting back of its insertion. If the muscles, especially those which act in the direction opposite to the strabismus, are weakened, muscular advancement is preferable to tenotomy, as the advancement not only straightens the position of the eyeball but also increases the action of the muscle on which it is performed, by affording it a more favorable insertion. The eye is thus more fully inclosed by its muscles, and while gaining in excursion in one direction does not suffer a loss in the other. The amplitude of convergence is favored more by an advancement of the rectus internus than by a tenotomy of the rectus internus. Furthermore, it must be borne

in mind that the ligamentous processes which attach the muscles to the orbit, and during their contraction serve as stop tendons, are not only relaxed by an advancement, but are stretched by the setting back of the insertion. They add thus to the weakness of the tenotomized muscle. In the higher degrees of strabismus advancement must be combined with tenotomy of the antagonist."

"De Wecker performs the operation of *advancement of Tenon's capsule* of the antagonist in order to heighten the effect of a tenotomy. This procedure is advantageous, as it increases at the same time the action of the muscle on which it is performed. Every operation on the ocular muscle must be continued with an orthoptic treatment in order to perfect its results. Convergence diminishes under the use of mydriatics, binocular bandages, and stereoscopic exercises. Divergence is diminished and convergence is increased by systematically exercising the latter. Immediately after the operation lorchettes (squint spectacles) prove beneficial. If the effect of the operation has been too great, the stitches should be removed soon in a case of advancement or the tenotomized muscle advanced by means of stitches. In cases of real divergent strabismus, pacific treatment does not give as satisfactory results as in convergent strabismus. Here we must operate sooner and oftener. The rules given above are also applicable to these cases. Simple tenotomy may be performed when a slight degree of strabismus is present and the muscles are in a normal condition. Advancement of the recti interni is indicated when they are weak. Advancement is to be combined with tenotomy when a high degree of strabismus is present. When the visual acuity allows it, stereoscopic exercises serve to re-establish binocular vision, and exercises in converging increase the range of convergence. By attending to all these points the ideal effect in the treatment of strabismus will be obtained."

"Abadie²⁷¹_{July, Aug.} protests very strongly against the use of *optic or orthoptic means in the treatment of strabismus*. He believes that the operation alone is sufficient to establish the normal position of the lines of vision as well as binocular vision, wherever this is possible. He expresses the ocular deviations in millimetres, and finds that with the aid of cocaine and stitches we are able to correct strabismus with the utmost precision. It would seem, however, that the author does not clearly define to himself what the

normal position of the eyes and binocular vision is, and that the experiments which he has made on the latter are not entirely satisfactory. For instance, he states that persons with normal eyes can obtain a correct judgment in Hering's well-known experiment only after prolonged exercise, and lose it as soon as they stop exercising." Landolt⁴⁶² lays stress on the importance of catching not only the muscle, but also as much as possible of the neighboring capsule while advancing the muscle. While recognizing the efficacy of de Wecker's procedure for strabismus of a low degree, he asserts that the advancement of a muscle with its capsule has a much more powerful effect than the simple folding of Tenon's capsule.

Fulton⁴⁶² advocates *operating early for strabismus*, and maintains that progressive deterioration of vision can be prevented in a great many cases by curing the squint, either by the use of glasses, or, if necessary, by an early operation. He also asserts that it is easier to restore binocular vision by operating early, and that deformities resulting from the procedure are less likely to occur.

Hansell⁹_{Aug. 18} thus sums his views upon *insufficiency of the internal recti muscles* :—

"1. In all cases of continued functional headache the extrinsic muscles should be examined.

"2: Insufficiency is found in E., H., M., and As.

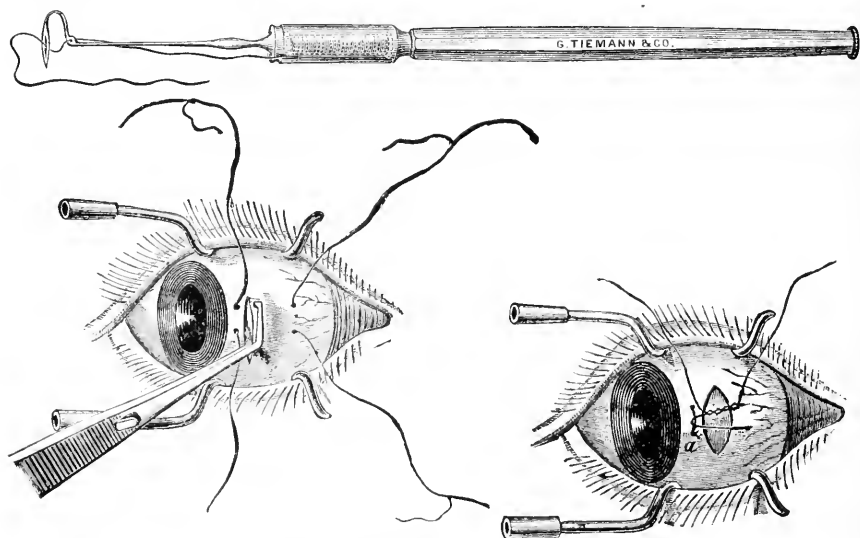
"Headache due to insufficiency can be relieved by prisms or by tenotomy—by the former if less than ten degrees, by the latter if more than ten degrees. In my experience an operation on both eyes has never been necessary."

Shakespeare⁴⁶² calls attention to the annoying phenomena resulting from *insufficiency or inequality of power of the superior or inferior recti muscles*. He has found a very simple and efficient remedy by the employment of a correcting prism, base up or down—or if there should be an error of refraction the simple decentring of the lens up or down suffices. He further says: "I have sometimes met with this trouble combined with insufficiency of the horizontal recti muscles, and have combined the remedies for each.

Coleman¹¹⁵_{Aug.} thinks that the *moderate continued exercise of the internal recti by the wearing of adducting prisms for distance* is much more effectual than electricity or than the gymnastic use of

prisms in relieving muscular insufficiency. Galvanism, he has found, lessens very much the pain and tenderness of the eyes, which accompany asthenopia, but electricity has appeared to him to accomplish very little in strengthening ocular muscles. Gradually increasing exercise of the eyes seems to be as much indicated in asthenopic hyperopes who are not relieved at once by glasses as in emmetropes with weak sight, for whom Dr. Dyer used it with signal success.

Prince¹⁰⁹_{Mar.} still further supports his opinion on *advancement of the recti* by the following statement:—



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“It is my belief that if the operation of advancement of the rectus were more studied and oftener practiced, according to the indications which will follow,¹⁰⁹_{June} less apprehension would attend an over-correction than an under-correction, for in the latter event it is found the simplest matter to insert a limiting advancement suture at the time of the operation, which will advance the divided tendon with mechanical precision; whereas, to increase the effect of a tenotomy for internal squint by the further laceration of the capsule is inaccurate and often directly harmful, for even when successful in restoring parallelism, it does so at the expense of the power of lateral motion, and is at times productive of asthenopia, and at others followed by subsequent divergence.”

Prince's question, section or exsection of the rectus in the *treatment of paralytic strabismus*, and that due to extreme over-correction with loss of motion, is answered by him ⁶¹_{Oct 13} in the following conclusions:—

1. In the case of complete paralysis of either rectus, the exsection of the opposing muscle will enable the eye to be retained in the straight position, without motion in that meridian.

2. In case of retraction of either rectus muscle into the orbit, under conditions rendering its advancement impossible, an equalization of the deviating power is to be obtained through section of its antagonist, posterior to its capsular attachment, following which, excursions in that meridian will be restored to an extent varying between twenty and fifty degrees.

3. In the above cases of paralysis, or retraction of either rectus, the operation of section or exsection of its antagonist has not been observed to develop or increase any pre-existing exophthalmos.

The cuts on page 52, which scarcely require explanatory text, may aid in the elucidation of the method.

Cullimore ²⁴⁹_{Mar.} adds a practical test to the truth of Liebreich's assertion that "the caruncle, together with the plica semilunaris, rest on a ligament which passes from Tenon's capsule to the edge of the orbit," by the cure of a divergent strabismus by advancement of the plica semilunaris two days after an unsuccessful pulley operation. The position of parallelism was sustained up to the time of writing the paper—"some months."

Reymond has studied the effect of the *range of convergence and of accommodation on the correction of strabismus*. He cites a case described by Schweigger, in which convergent strabismus of a high degree was temporarily cured by orthoptic exercises. Nevertheless, a tenotomy had to be performed. The author describes the effect of this operation on the range of relative accommodation and convergence. The complete correction of strabismus and the re-establishment of binocular vision can be obtained only when this range again becomes normal.

Claiborne, ¹_{Mar. 3}, noticing in making examinations for *hyperphoria* that the eyes are frequently situated in different horizontal planes in the skull, concluded that if there be equal tension of the vertical muscles the same image cannot be formed on the macula of

each eye. From these facts he formulates the following propositions:—

“1. There is a condition in which the eyes lie in the same horizontal plane, the tension of the vertical muscles of each eye is equal, and the visual lines lie in the same plane.

“For the want of a better term I would call this condition *isophoria* (ἴσος, equal; φόρος, a tending).

“2. There is a condition in which the eyes lie in the same horizontal plane, the tension of the vertical muscles of one eye is equal, and that of the same muscles of the other eye is unequal. Under such circumstances the visual line of one eye tends to deviate from that of the other, which is the standard; if the deviation is downward, the condition may be called *vicious hypophoria* of that eye; if the deviation is upward, the condition may be known as *vicious hyperphoria* of that eye.

“3. There is a condition in which one eye is situated higher in the skull than the other; there must be a compensatory overtension of one vertical muscle in such cases, in order to accomplish single binocular vision. Such overtension should not be considered as *vicious*, but rather as *compensatory*.

“The terms *compensatory hyperphoria* and *compensatory hypophoria* may then be applied to any appropriate case that comes under the latter condition.”

Buller²⁵⁷_{Feb.} has found *hyperphoria* and *exophoria* of more frequent occurrence than he had anticipated, and thinks that it is of extreme importance. He considers “no test of the muscular functions to be complete unless the condition of the superior and inferior recti is carefully taken into account.” Webster⁹_{Oct. 6} has done forty tenotomies for the *correction of heterophoria*. He concludes that “no person should have tenotomy done for heterophoria alone, without symptoms of strain due to it. Very slight degree of tendency to deviation may require correction. All other methods of treatment should be tried before resort is had to operation. The operation should be done under cocaine, and the effect produced from time to time tested with prisms. In judiciously selected cases, the results are quite as good as are obtained with most other surgical procedures.” Stevens’ *treatment of hyperphoria*²¹⁹_{No. 2} is tenotomy, though he says that if the patient is unwilling to submit to a radical relief, or if the surgeon hesitates to perform the opera-

tion; if complicating circumstances render such an operation inadvisable, other means may be resorted to. Thomas¹¹¹⁷_{Mar. 14} says: "My own experience covers many of these operations, performed for the relief of a variety of conditions, and, notwithstanding serious difficulties at times encountered, I have a steadily increasing confidence in the legitimacy and value of the method."

Purtscher²⁵⁴_{June} has made a complete and satisfactory study of the *traumatic paralysis of the external rectus muscle*. He makes two classes—the orbital and intracranial. Mauthner⁸⁴_{June 16, 23} has given some interesting diagnostic points in the differentiation of the *elevators and depressors of the eye*. He finds that if there be diplopia in the upper or lower field, a corresponding elevator or depressor is involved. To determine which special muscle is at fault, the greatest vertical distance between the vertical images is first sought and the angle of inclination studied. He then gives the following results: (*a*) greater distance above and to the left; (1) image of the left eye higher indicates left superior rectus; (2) image of the right eye higher indicates right inferior oblique; (*b*) greatest distance above and to the right; (1) image of the right higher indicates right superior rectus; (2) image of the left higher indicates left inferior oblique; (*c*) greatest difference below and to the left; (1) image of the left eye lower indicates left inferior rectus; (2) image of the right eye lower indicates the right superior oblique; (*d*) greatest difference below and to the right; (1) image of the right eye lower indicates the right inferior rectus; (2) image of the left eye lower indicates the left superior oblique.

Grainger Stewart³⁶_{Sept.} has seen a female patient, who sixteen years previously had what was termed "rheumatic fever," during which time there was *right ptosis and paralysis of the right internus*, with motor paralysis of the left leg. This attack was followed by cephalalgia, vomiting, polyuria, and peculiar convulsive seizures, which came on if the left eye was *closed*, or if anything was placed before it so as to obstruct the view of surrounding objects. During the spasm she falls forward, making a loud, snort-like inspiration, remaining unconscious about one-half minute. During this entire time the eye remains turned upward. The right eye is absolutely blind and its movements are perfect, whilst the left eye is highly hypermetropic. Her hearing and taste are normal, but there is complete loss of smell. Although from collateral history it seems

that the symptoms came on only while she was in the erect posture, yet it would be interesting to know whether the first closure of the eye for sleep was productive of the same symptoms.

In a case of simple depressed fracture of the skull, followed in four months by epilepsy, in which the seizures began in the left hand, ophthalmic examination by Oliver^{5 Oct.} failed to reveal any ocular abnormality, except a *failure of full response of the iris of the right eye to light stimulus in monocular action*. Trephining over the centre for the left hand and supramarginal convolutions revealed a spicula of bone adherent to a thickened and deeply pigmented dura mater, situated over the supramarginal convolution. Not only has there been entire cessation of the epileptic seizures, but in twenty-four hours after the operation the iris of the right eye responded separately, equally and as freely as its fellow. He says: "This isolated symptom of want of proper reaction of the right iris to light stimulus alone (a species of monocular Argyll-Robertson pupil), which was relieved by the operation, consisting in the excision of a portion of the cortex and subcortical tissue in the right supramarginal convolution, is, as far as the observer is aware, a new observation, and may be of value in further determining and better localizing the situation of interruptions in the light reflex act."

Beaunis,^{3 Feb.} describes two varieties of *nystagmus* of cerebral origin, direct and reflex, which are subdivided into lateral, oblique, and rotatory, the first being unilateral and the second always bilateral. The direct variety is found on the side opposite to the cerebral lesion, and is said to be dependent upon irritative or destructive lesions of the corpora quadrigemina, and is frequently associated with isochronic oscillations of the upper eyelid and of the head. The reflex variety is dependent upon various forms of intracranial disturbance. He also reports several cases,^{190 Sept.} one of which, in an infant, was uniocular. Norrie^{373 Mar. 21} relates a case of *unilateral nystagmus* in a man aged forty-three, with multiple insular sclerosis of the central nervous system and sclerosis of both papilla nervi optici. When the patient fixed his eyes under the horizontal line, the movement of the eye was performed in the horizontal plane; by raising the eyes over the horizontal line, the movements were rotatory, until they at last stopped, when the eyes were raised up to the extreme degree. (Report of Holger Mygind, of Copenhagen, corresponding editor.)

Tangemann⁵³_{June 9} gives the details of a case of *paralysis of the third pair* occurring in a woman. The eyelids were completely closed. On elevating them there was found extreme deviation of the eyeballs, dilatation of both pupils, and loss of motion of all recti muscles excepting the external. The color-field and vision were normal. Total paralysis of accommodation existed. These symptoms occurred suddenly. The cause could not be determined. Ophthalmoscopic examination revealed nothing. After three months' treatment the patient's condition remained the same as when first seen.

Bull,¹⁰⁷⁰₁₈₈₇ in speaking of passive motion in the *treatment of paralysis of the ocular muscles*, says: "In considering the results of treatment by passive motion in these twenty-one cases, it will be seen that the paralysis was entirely cured in eight cases, partially relieved in six, while in seven the treatment proved valueless. This is certainly no brilliant showing, and yet the results are sufficiently favorable to make it advisable to continue our efforts in this direction. A more extended experience may, perhaps, teach us that passive motion in connection with the careful application of the galvanic current may give us better results than heretofore in the treatment of paralysis of the ocular muscles of long duration."

Schmidt-Rimpler²⁵⁴_{Dec., '97} has had a case of glioma in the anterior portion of the pons varolii of a five-year-old girl, with *progressive paralysis*, which commenced in the right internus. Just before death a double optic neuritis developed.

Rumschewitsch⁷²⁵_{May, June} gives the descriptions of two cases of *external ophthalmoplegia*. He cites one hundred and seventeen cases described by various authors and discusses the pathology of the affection. (Report of Dr. Maklakoff, corresponding editor at Moscow.)

Evetsky²⁷⁴_{Nov., Dec., '97} reports the case of a female child with *transient complete ophthalmoplegia externa*, with paralysis of the soft palate, loss of sensation in the mucous membrane of the fauces following a probable attack of faucial diphtheria. A distinct family history of syphilis with probably hereditary symptoms during infancy are given. The case is interesting by reason of the absence of complications of the ciliary muscle and sphincter pupillæ. Jacoby¹⁷⁴⁰_{Apr.} gives an instance of the external bilateral variety occurring in a forty-seven-year-old man. Meyer's case⁶_{Sept. 15} in a sixty-two-

year-old male showed marked peripheral neural changes. In *ophthalmoplegia externa partialis*, Starr²¹²_{May} arrives at the following conclusions:—

“Therefore, in any case in which the muscles moving the eyeball are involved, it may be possible to locate the lesion. If the iris alone is affected, the lesion is small, and lies either in the ciliary ganglion in the orbit, or just at the opening of the aqueduct of Sylvius into the third ventricle. If all the muscles of the eyeball are affected together, the external rectus and superior obliquus, as well as those supplied by the third nerve, *excluding the iris*, the case is one of *ophthalmoplegia externa totalis*, and the lesion lies in the gray matter of the floor of the fourth ventricle and of the aqueduct of Sylvius. Both eyes are then involved. If all the muscles of the eyeball supplied by the third nerve are affected, *including the iris*, the case is one of total peripheral paralysis of the third nerve, and the lesion lies on the base of the brain, and may in time implicate other cranial nerves. One eye is usually alone affected.



(Journal of Nervous and Mental Diseases.)

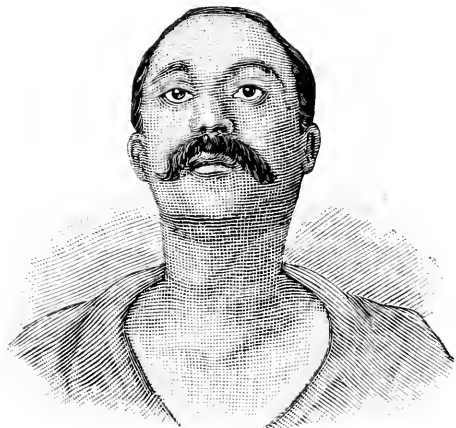
others escaping, the lesion lies in the tegmentum of the crus cerebri, between the nuclei of origin and the point of exit of the third nerve. One eye or both may be affected, but both eyes are rarely affected in the same manner.

“There is but one exception to the last conclusion, and that is in the case of post-diphtheritic ocular paralysis, in which the peripheral branches of the third nerve are affected after the entrance of the nerve-trunk into the orbit. And here the existence of a diphtheria preceding the paralysis will establish the diagnosis.”

The above cut well illustrates the ptosis, visual divergence, and automatic action of frontalis to keep the palpebral fissures open, seen in one of Seguin's cases²⁴²_{May} of *ophthalmoplegia*, the case being one of bilateral external and internal *ophthalmoplegia* in a

syphilitic subject. The author gives the histories of three similar cases, besides one of the external type, and a fifth of the internal variety.

Ballet,¹⁷³_{July, Aug.} has contributed a valuable series of articles on *external ophthalmoplegia*, studying the different symptoms *ad seriatim*, in association with a description of several interesting cases occurring in his own practice and in the practice of others. The accompanying figure represents a case of paralysis of all the ocular muscles, the case being one of exophthalmic goitre, and external ophthalmoplegia with hysteria. In a few of his conclusions he says: 1. It is known that external ophthalmoplegia consists in paralysis of the muscles of the eyeball, with possible integrity of the functions of the levator palpebrarum and constant preservation of the movements of the sphincter pupillæ and of the ciliary muscle. 2. These symptoms may be found among individuals simultaneously suffering from exophthalmic goitre and hysteria, combined or alone. 3. In these cases external ophthalmoplegia signifies that there exists a paralysis of the oculo-motor nerves, the



EXTERNAL OPHTHALMOPLÉGIA.
(*Recueil d'Ophthalmologie.*)

cause of which is certainly central and resides on the level or above the real origin of these nerves. 4. The possible coincidence of external ophthalmoplegia and of exophthalmic goitre constitutes an argument in favor of the theory which belongs to Basedow's disease, of a disturbance of the central nervous system, particularly of the medulla oblongata. 5. Moreover, we may observe among persons affected with exophthalmic goitre paralysis of the other motor nerves emanating from the medulla—the motor branch of the trigeminus, facial nerve, and the hypoglossal. These invariable symptoms have the same pathogenic significance as ophthalmoplegia.

The second figure, which is in reality quite a doubtful instance, is here inserted to illustrate the appearance of the eyes and

neck of a patient supposed to be suffering from exophthalmic goitre.

In a case of tumor of the second frontal gyre, Mills ²⁴²_{Dec. '87} found ptosis on the same side as the lesion, and says: "If not conjugate deviation, there was, at least, some immobility of the eyes. Diplopia also was present for a time. The patient seemed sometimes to have a slight right internal squint." Unfortunately, no ophthalmoscopic examination could be made. The patient had intolerance of light all the time, especially marked in the right eye. In a second case—a tumor of the optic thalamus—there was right facial paralysis, followed by profound right hemiplegia. The pupils were irregular, the left being contracted. There was paralysis of the right externus. He has seen several cases of

unilateral paralysis, involving face, and both upper and lower extremities of the same side. He explains the upper facial paralysis not from the situation of the tumor in the thalamus, but either from the pressure exerted by it, or the inflammation and œdema adjacent to it, or from both conjointly. In this indirect way, both the capsule and lenticular nucleus were involved.



(Revue de Médecine.)

A case of *clonic spasm of the orbicularis and levator labii superioris and alæ nasi* was seen by Darbishire ²_{Nov. 10} in a young college student, who, he said, had impairment of nutrition, from want of force in the circulation, caused by imperfect assimilation. He thinks the excessive impairment of the functions accounts for the special extent of the spasms.

In writing of *habit chorea*, de Schweinitz ¹¹⁷_{May} wishes to emphasize the fact that if the habit spasm especially affects the muscles of the face, particularly those around the eye, the following points deserve attention: 1. The condition of the refraction and the muscular balance should be carefully examined, and, if found abnormal, corrected. 2. The anomaly of refraction should be determined under complete ciliary paralysis, and the full, not a partial, correction ordered. 3. This correction should be employed

in conjunction with proper internal medication and general hygiene, and not to the exclusion of these measures.

Colburn²⁰⁷_{June} gives the history of a case of a minister who, upon account of frequent epileptic seizures and mental disturbance, associated with inability for use of eyes, had, after eight years' suffering, an insufficiency of the external recti muscle treated by exercise with prisms, and a "hereditary hypermetropic error of refraction" carefully corrected with proper convex glasses. From this time the patient gradually improved, until at the date of the report he had had no seizures for more than one year and his mental condition had become so much better that he was, to use his own language, "able to do a good day's work without any symptoms of his old trouble."

A *six-fold paralysis of the left cerebral nerves* is reported by Grossmann,²⁴⁹_{Sept.} of Buda-Pesth. The sixth, the facial, including its upper branches, the seventh, the eighth, the ninth, and the twelfth were all involved. The history seemed to indicate syphilitic gummatous periostitis at the base of the brain, terminating in pressure on the basal surface of the pons. Ole Bull's case²⁴⁹_{June} of *paralysis of the oculo-motor nerve* on the right and of the *abducens* on the left side in a thirty-year-old syphilitic patient is of great clinical interest. As anatomical and physiological investigations make it probable that associated movements in lateral directions are produced by fibres that take their origin from the centres of both the oculo-motor and abducens, which has been shown by Duval to be true for the abducens, associated with the case of Féréol, where a tuberculous deposit in the centre of the abducens caused a paralysis of the externus of the same side and of the internus of the opposite side, would be evidence at least that there was an affection in this case in the region of the centre of the right oculo-motor.

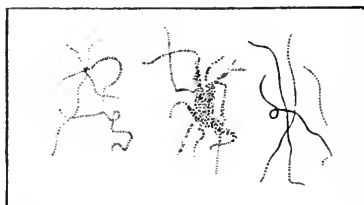
Borel²⁷⁴_{Dec. '87} has found *enervation of the interni* a very frequent producer of progressive tabes dorsalis. The subject is made to steadfastly gaze at some binocular near point for a prolonged time, when weariness or diplopia will soon manifest itself.

Samelsohn³⁵³_{Nov. 15} reports a case of *Horner's ptosis* due to disease of the cervical sympathetic, occurring in a woman sixty-five years of age.

DISEASES OF THE CONJUNCTIVA.—F. B. Wilson¹³⁸_{May} reports an *encysted eye-stone* in an upper *cul-de-sac*, which had probably been

in situ for thirteen years. Silex²⁵⁴_{Bd.18, H.2} records a curious case of blue or violet *discoloration* from a bit of aniline pencil lodging in the conjunctiva. Energetic irrigations brought back the natural colors of the eye. P. J. Thomson⁶_{Apr.14} reports a case of extremely rapid *staining* of the epithelium of the bulbar conjunctiva, followed by severe inflammation, in less than a minute's time, from the introduction of a small fragment of aniline beneath the lids. The staining, which was of an intense violet-blue color, gradually disappeared in two days' time, but the inflammation, which was complicated by the effects of a small abrasion of the cornea, persisted for several weeks.

Grossmann⁷⁶_{June} has presented us with two beautiful pictures of *argyria of the conjunctiva*. They were obtained from a case where a very strong solution of nitrate of silver had been used for six months, resulting in an extremely dark discoloration, which was confined to the elastic fibres. The



ARGYRIA OF THE CONJUNCTIVA.
(*Ophthalmic Review*.)

large figure gives a picture of the more isolated heap of fibres. In some parts solitary and agglomerated grains of a deep-black pigment were visible, which were nothing but old elastic fibres, stained and broken into granular detritus. In some cases, as in the small figure, the fibres were broken at the ends only; in others, the whole length was dotted. There were other parts, again, which consisted of agglomerations of black pigment and dotted fibres.

Kipp⁵⁹_{Oct.6} reports three cases of *conjunctivitis* following the prolonged use of *cocaine*. Mittendorf⁹_{Oct.6} also cites three cases of recurrent *acute conjunctivitis* with marked hypersecretion from the repeated use of *cocaine*. Ayres' case²⁴⁹_{Sept.} of *granulations of the conjunctiva* produced by the continued application, several times

daily, of a 5 per cent. solution of *cocaine* for more than a year, and which rapidly recurred, after almost complete cure, by the instillation of a few drops of the drug, is another warning against the too free use of the drug, especially when left to the patient's own desires.

Two cases of *acute chemosis of the conjunctiva*, lasting but twenty-four and forty-eight hours respectively, have been observed by de Schweinitz.^{347 Dec.} Both occurred in syphilitic subjects, who were under the influence of iodide of potash. The second case showed "a beautiful picture of symmetrical disseminated choroiditis with string-like opacities in the vitreous." He accepts in explanation Burnett's very plausible theory of neuralgia of the fifth pair, producing conjunctival hyperæmia resulting in chemosis, by reason of choroidal disturbance, based upon an interesting case of acute transient chemosis of the conjunctivæ, occurring in a student suffering from a slight disseminated choroiditis for which quinine and coquilles were ordered, the chemosis ensuing after a severe attack of left hemierania with left-sided ocular pain.

Ophthalmia Neonatorum.—Mules^{90 Jan.} has given, in his prize essay upon *ophthalmia neonatorum*, four varieties of *contagious ophthalmia*, tabulated, in the order of their pathological importance, diphtheritic, gonorrhœal, purulent, and catarrhal, the last three, when they attack a newborn child, being grouped together under the generic title of *ophthalmia neonatorum*. After giving the definition of *ophthalmia neonatorum* as a blenorrhœal disease of the palpebral conjunctiva of a newborn or a comparatively newborn child, he divides inoculation into the primary, "where materno-fœtal inoculation takes place during or immediately after birth," and secondary, "when the disease commences after such a lapse of time as to insure its being the outcome of post-partum inoculation." Primary inoculation takes place by one of the following methods: manual manipulation during examination of a face presentation; the accidental opening of the eyelids by instruments; retention of contagious mucus upon the child's eyelids after birth, and its subsequent inoculation upon the conjunctiva; and lastly, by the direct introduction of contagious muco-pus into the eyes by the edges of the perineum pushing the lower lids down, and thus opening the palpebral fissure and allowing the entrance of the vaginal secretion, during the passage of the fœtal head through the external orifice, this being rendered possible by the

elongation of the head and the extension of soft parts, "together with the immature development of the nasal bone and absence of the bridge," causing the eyes to project in profile. Clinically he has found that boys are more frequently attacked than girls, which he attributes to the greater size of the male head, and that children of primipara are especially liable (80 per cent.), followed by those born after tedious labors, with weak expulsive pains at the finish. The methods of secondary inoculation, he thinks, are due to direct contact with various unclean materials, the neglect of thorough cleansing of anything upon the eyes, and the failure to employ thorough disinfection of the eyes when there has been a vaginal discharge previous to the birth of the child. Conjunctival affections caused by local irritants, as soaps, spirits, exposure to draughts, or bright lights, may occur, but are amenable to simple remedies.

The symptoms are divided into four stages: (1) incubation; (2) lymph secreting, slightly infectious; (3) pus secreting, very infectious; (4) recession. He considers that the complications which for the most part affect the cornea are the most dangerous to vision, but says that there are two conditions of the lid which militate against recovery. These are: (*a*) a short palpebral fissure, short lids, and (*b*) lympho-membranous deposit on the palpebral conjunctiva. The corneal complications are essentially destructive in their nature, and whether the cornea be perforated in its entire thickness or only through a portion of its layers, the stages through which it passes are the same. These are: (1) erosion; (2) maceration and softening; (3) micrococcal infiltration and necrosis; (4) repair. The constitutional symptoms in a case of some gravity are fever, nervous irritability, stomach irritation, and general depression.

The treatment he divides into preventive and curative. The following rules are laid down for the former: "1. Cure of all cases of chronic vaginal discharge before labor by suitable local applications. 2. Irrigation of the vagina during the second stage of labor, when vaginitis is known to exist. 3. By assisting the fetal eye to pass beyond the perineal edge without resting. This is easily done by hooking the finger around the perineal edge and drawing it down. 4. By wiping the eyes with a clean cloth at birth of head. 5. By instilling an antiseptic solution into child's

eyes at birth, *if the mother is known to have vaginal discharge*. 6. Never wash the face in the water in which the body has been cleansed. 7. To retain one sponge or flannel for the child's face, and to insist on scrupulous cleanliness. 8. The nurse to wash her hands after adjusting the mother, before touching the child. 9. Not to unduly expose the child to bright light, draughts, etc. 10. To protect the child from flies with a thin veil. 11. To carefully remove the child from the immediate vicinity of another similarly attacked. 12. To guard the one eye if the other is affected. 13. To print and diffuse through every family such aphorisms as are advisable and easily understood. 14. To specially instruct all nurses and individuals in these rules, and to point out to all medical practitioners the necessity of seeing them carried out in their entirety."

He asserts "that a perfect knowledge of the curative treatment of ophthalmia neonatorum is essential, and if carried out promptly and efficiently, corneal complications can scarcely arise." His special plan of treatment, modified from that of Gräfe, being the outcome of long experience, is given dogmatically in the "belief that it is the best for those placed under our care." "The child is usually brought to the surgeon when the third or purulent stage is reached; it is rarely that we have the opportunity of trying to abort it during the second stage. If, then, a child is brought to the surgeon with evident marks of ophthalmia neonatorum, every stage of the examination and treatment should be conducted with the utmost gentleness. The mother or nurse should first wash the eyes in warm water to remove the secretion and free the lids. The surgeon should be seated in a convenient chair with a folded towel across his knees, and with medical appliances within reach of his hand. These appliances are: (1) a plentiful supply of pieces of clean rag; (2) solution of argenti nit., five grains to the ounce, and ten grains to the ounce; (3) vessel of clean water; (4) two camel-hair pencils to apply the solution and wash the excess of fluid away; a bottle of eserine, five grains to the ounce, and a dropper; (6) lid elevators. He then receives the head between his knees, supported by the towel. The nurse, tucking the child's legs under her left arm, supports the body on her raised knees, holds the child's hands with one hand, and has the other at liberty to assist the surgeon. The surgeon first proceeds to examine the

condition of the cornea. If there is any difficulty he uses an elevator; a bent hairpin often answers admirably. He next everts the lids, wipes them dry, paints them with a silver solution of the required strength, taking special care to get to the back folds of the conjunctiva, and washing off the excess of solution with clean water, carefully replaces the lids by drawing them downward and away from the globe. This process is repeated by the surgeon every morning until the disease is arrested, his object being to produce a slight eschar which either destroys the micro-organisms or prevents their multiplication. The effect lasts about twelve hours. In severe cases the solution can be reapplied at night. However careful the surgeon may be, his efforts are of little avail unless he is ably seconded by the nurse. Her duties are: to prevent the re-collection of pus by constantly opening the lids and wiping the matter away with clean rags; to wash the conjunctiva with weak alum or boracic solution, three grains to one ounce; to anoint the lid margins with cerate to prevent adherence, and to combat feverish restlessness by fresh air and careful attention to diet.

By irrigation of the vaginal tract with a solution of corrosive sublimate, one to three thousand, and mopping the closed eyelids of the child with the same, after having washed the eyes with distilled water, according to the plan of Kaltenbach, Nebel³¹⁷ records three hundred and thirty childbirths without a single instance of ophthalmia. Kaltenbach²⁹³ ⁵¹ claims that this plan avoids any irritation of the child's eyes. ^{B4.14,H.13; Mar.} Levan,³⁶⁶ ⁵¹ on the other hand, after careful investigation, gives preference to Credé's method, preferring, however, several drops of a 1 per cent. solution of nitrate of silver in lieu of one drop of the 2 per cent. It is very interesting to note that in one case where the silver solution was instilled into but one eye the fellow became affected. Levan has detected gonococci in the vaginal secretion after a thorough irrigation of the whole tract with one to two thousand corrosive sublimate solution. Observations made by him in two sets of cases, as follows: (1) in which thirty cases of labor were treated by vaginal irrigation with sublimate solution and the child's eyes wiped with clean cotton at birth; (2) in which Credé's method was used in one hundred newborn children, where there had been no previous irrigation of the maternal passages.

In the former series, mild ophthalmia occurred in five of the children, in two of which gonococci were detected in the ocular secretion, whilst by Credé's method not a single case of ophthalmia occurred. He therefore considers Credé's method entirely satisfactory. By careful antisepsis and cleanliness, Ahlfeld³⁸³_{Bd.14,H.2} has not had a single case of decided ophthalmia neonatorum for three and a half years in his clinic at Marburg. Dr. Bell's instructions,²_{Mar.3} attached to the vaccination form of Bradford, England, regarding newborn infants' eyes, are very pertinent: "If the child's eyelids become red and swollen, or begin to run with matter within a few days after birth, it should be taken without a day's delay to a doctor. The disease is very dangerous and if not at once treated may destroy the sight of both eyes." His assertion that 72 per cent. of the blind in England were so from ophthalmia neonatorum is astounding, and should induce us, as he suggests, to supply the registrar of births with slips of paper containing plain directions for the prevention of such conditions. He showed that the total cost for the Bradford district was exceedingly trivial, and calculated that the entire expense for the whole of England would amount to but thirty pounds annually. Based upon Roux's demonstration that pure alcohol removes all loose gonococci, Mules²_{Feb.4} proposes to treat cases of ophthalmia neonatorum by everting the lids, drying them with a soft piece of clean rag, and washing them freely with *ethylic alcohol*, followed by flooding with one to two thousand solution of corrosive sublimate. He remarks that, as far as he finds, "the discharge is arrested by its use, but that the granular condition of the lid is not so rapidly reduced as by silver nitrate." Might not a combination of both plans be a preferable method? Illingworth²_{Feb.18} adds his testimony to that of Mules as to the *value of mercuric germicides*. He uses the mercuric biniodide in a solution of sodium iodide, made by the addition of bichloride of mercury to the iodide of sodium in glycerine, with marked success in ophthalmia neonatorum.

Cold compresses constantly applied to the eye for several days are recommended by D'Oench¹⁵⁰_{July} as the best treatment both for ophthalmia neonatorum and gonorrhœal ophthalmia. He uses four layers of linen cooled on ice and changes them twice in the minute. If the case be seen in the acute stage, when the inflammation of the lid is increasing, he renews the application much

oftener, but as the inflammation recedes the compresses are applied less frequently. This treatment is based upon the theory that the gonococcus is developed very slowly or not at all at the temperature of 30° C. Boric acid and bichloride of mercury solutions he considers valuable for cleansing purposes. Credé's method for the prevention of ophthalmia in the newborn is preferred by the author. Lloyd Owen⁴⁹_{Feb.} recommends antiseptic treatment from the outset. He employs weak lotions containing boric acid or carbolic acid, or boric acid and hydrarg. perchloride, freely anointing the lids with iodoform in vaseline and nitrate of silver solution, fifteen grains (one gramme), in the severer forms. Atropine is added to the treatment if there be any loss of corneal transparency. Costella⁵⁵³_{Nov. 87} has found that an 8 to 10 per cent. solution of *bicarbonate of soda* instilled three or four times daily into the conjunctival sac, has acted efficiently in the treatment of blenorrhœa. His experiments were based upon the assumption that the gonococci thrive in acid mediums and die in alkalies. Tilley,²³¹_{Mar.} in a lecture upon purulent ophthalmia in the newborn, gives some excellent advice in reference to the treatment. Tange-mann⁵³ has found a four-grain (0.23 gramme) solution of the salicylate of eserine the best agent in blenorrhœal conjunctivitis. This treatment he associates with hot saturated solutions of boracic acid used as a dressing. Howe⁸_{Sept. 13} has conclusively shown that the appearance and prevalence of *Egyptian ophthalmia* is associated with the *common house-fly*. He has been able to demonstrate the existence of the pathogenic microbes by gelatine and agar-agar cultures of the material gathered from the legs of the animals.

Gonorrhœal Ophthalmia. — Burnie²²_{June 21} regards gonorrhœal ophthalmia and purulent ophthalmia of infants as two distinct affections. He says that the former only occurs in those suffering from gonorrhœa, and, contrary to direct clinical evidence, says that it never occurs in second parties. In his opinion it is due to metastasis similar to gonorrhœal synovitis. Frague also upholds the doctrine that a definite form of conjunctivitis accompanies gonorrhœa, which is proved to recur at the time of each relapse and to be dependent upon an exacerbation of rheumatic diathesis produced by the primary disease. Tiffany¹⁰²_{Sept} has found the application of cold in addition to the ordinary measures much more beneficial treatment than heat. He cites one case in testimony of

this treatment. In reply to this, Fryer¹⁰²_{Oet.} says that he has failed to perceive the least benefit from the use of cold and has abandoned it. He prefers hot water, to which he called attention two years ago. *Mercuric bichloride* from one to twenty-five hundred to one to ten thousand has been found useful by Alt³⁴⁷_{Nov. '87} in various forms of conjunctivitis. *Yellow oxide of mercury ointment* (official strength) made with lard is highly recommended in "contagious ophthalmia, in all its stages" by a correspondent¹⁸⁶_{May} signing himself A B C. According to this unknown person, a single application has never failed "to cure [*sic!*] the disease." *Naphthol* one to five thousand is favorably spoken of by Valude²⁶_{Sept. 1} as an adjunct in the treatment of the various ophthalmias, as it rapidly reduces the swelling of the lids and acts antiseptically. With the strength employed he found that it had no marked influence over the discharge. The editors of the department would ask, would it not be well to try stronger solutions? Valude²⁴_{Apr. 1} describes a peculiar form of *purulent ophthalmia* which seems to be due to infection from *rubeola*. The primary stage, which usually appears a few weeks after the general disease, is seemingly phlyctenular in type, though soon followed by infiltration, swelling, and hardness of the palpebral conjunctiva and lid tissues.

Reich³⁶³_{Feb.} has used the *galvano-cautery* in the form of a delicate needle over small areas of follicular conjunctivitis. Each accessible follicle is punctured, or, if confluent, the area is lightly touched. He finds the method more valuable than any other, causing rapid amelioration of the inflammatory symptoms. Thomson, of St. Louis,⁸²_{May 19} advises *expression of the contents of* the follicles by means of forceps in addition to ordinary local treatment.

Syphilitic Conjunctivitis.—Goldzieher¹⁹⁰_{Apr.} gives the notes of cases of two young men who, six and two years after contracting syphilis, came to him with thickened lids and a granular, swollen condition of the conjunctiva of both lids, the color of which could be compared with light-yellow honey or blood-serum. Both patients had auricular and post-cervical adenitis, the second case being complicated with grave changes in the cornea and uveal tract. They recovered in a short time by the free use of mercurial inunctions, although having previously been submitted for several months to all manner of local applications without avail. Sattler¹¹³_{May 6} reports a similar case occurring in a middle-aged female.

Goldzieher's monograph¹¹²⁰ upon granular conjunctivitis, giving the histological and pathological anatomy of the membrane, the ætiology, prophylaxis, and treatment, both remedial and radical, is very readable and contributes much that is new to the subject.

Syphilitic manifestations of the conjunctiva, brought as far forward as Goldzieher's two cases, are carefully studied by Alexander.¹¹²¹

Trousseau⁴¹⁴
Apr., June has seen two cases of *gumma of the palpebral conjunctiva*. The masses appear like chalazæ protruding upon the mucous surface of the lid. Ulceration occurs. Prognosis is good, leaving cicatrices. Complications are rare. Duration is about six to ten weeks. They occur as one of the secondary lesions of syphilis. Antiseptic washings and iodoform ointment, with large doses of iodide of potassium and mercury by inunction, are advised.

Granular Conjunctivitis.—Both Abadie and Petresco have employed *lemou-juice* in addition to other remedies in *granular conjunctivitis*. The former observer has made comparative studies and finds that the eye treated by this additional means recovers much more rapidly than the opposite organ which receives nothing but the ordinary remedies employed in that disease. He repeatedly cauterizes the entire surface of the conjunctiva with the juice, without reference to the cornea, every six hours.

Jacobson¹¹¹⁹ recommends the *radical treatment* of follicular conjunctivitis. For granular affections of the conjunctiva and cornea Landolt writes us that he uses with great success *direct massage*, with pure *boric acid*, pulverized as finely as possible. The lids are everted and the recesses, folds, and angles of the eyes thickly covered with the powdered acid. The diseased parts are then rubbed with the fingers for several minutes. "This treatment is also good for pannus of the conjunctiva bulbi and of the cornea." The pain, which is not so great as one might think, is still less when a few drops of a cocaine solution are instilled beforehand, or the finger covered with a layer of vaseline. No doubt other powders would give similar or even better results. He is at present experimenting with massage, which, though seemingly new, is in reality very old. It was mentioned to him "by Egyptian and Greek colleagues, who saw it used by the people, and even found it described in the older works of the Orient." The granulations disappeared very rapidly, and the cornea clears up marvelously

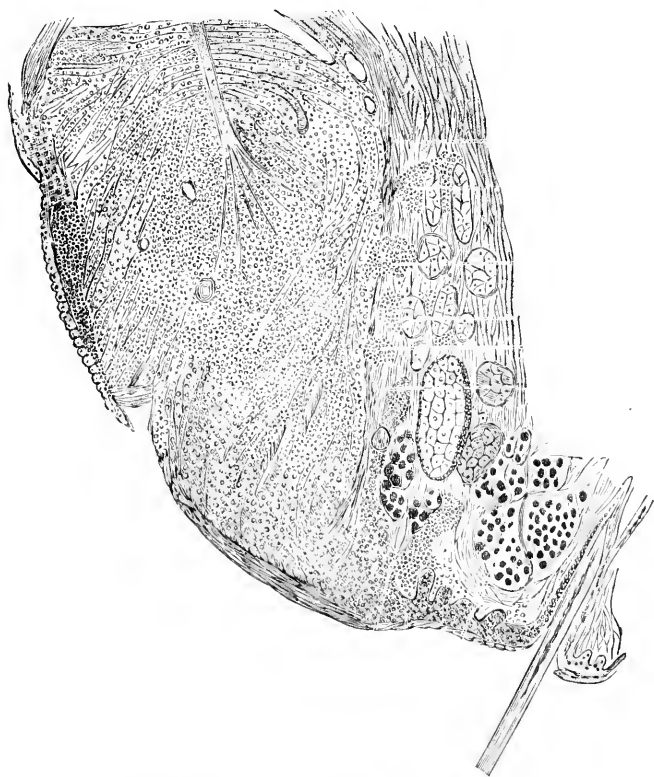
well under the influence of this massage. Abadie¹⁷¹_{p.179, '87} advises, in the severe cases of granular lids, multiple and daily *scarifications of the mucosa*, followed by cauterization with the glycerite of cuprum sulphuricum (cupr. sulph. 1, glycerine 8). If the irritation is very great, the treatment is begun by applying leeches to the temples to induce depletion of blood.

A case of *pemphigus of the conjunctiva*, reducing vision to quantitative perception of light in a twelve-year-old boy, is reported⁶¹_{Feb. 4} by Tilley. The disease, which appeared at five years of age, coincided with an attack of vaccinia, and resulted in a symblepharon in which the lids were nearly wide open, leaving between them a dry, heavy follicle, over which no tears could be made to flow. The only family history bearing upon the subject was the fact that the mother had a "contracted condition of the conjunctiva of the upper lids resulting in inverted ciliae." Separation of the lids from the globes met with failure. Two cases of *polypus of the conjunctiva* of the lower lid are reported²⁶_{Aug. 1} by Grossmann. The first occurred in a female, aged twenty-nine years. The lower lid bulged and its free margin did not touch the eyeball. On turning it down an oblique, semi-transparent, pediculated tumor of a reddish-gray color was seen. The growth was excised without difficulty, except considerable bleeding, which was controlled by cauterization with nitrate of silver. Microscopically it showed very nearly the same structure as other mucous polypi—"loose bundles of connective tissue with small and large interstices." The second case, which occurred in a male twenty-six years of age, had the same history and the site of the growth was in the same position, the only difference being that the tumor consisted of three lobes. It was easily removed, the bleeding being slight. Under the microscope "it showed a denser and thicker connective tissue than the former, and may thus be classed among the fibrous growths." Under the title of "Polypoid Tumors of the Conjunctiva," Elsching²⁵⁴_{Bd.19, H.1} discusses the propriety of better classification, and cites the instance of one which had the texture of a soft fibroma with great vascularity. Feilchenfeld¹⁹⁰_{Apr.} has been so fortunate as to meet with a *non-pigmented sarcoma of the tarsal conjunctiva*, of which we give sketch on the next page.

Gillet de Grandmont¹⁴_{Oct. 14} has reported a case of *lupus of the conjunctiva* in a child. The tumor was excised and used for

experimentation on the anterior chambers of a rabbit. In five weeks' time, inflammation and degenerative changes appeared similar to those which were produced by inoculation of tuberculi from the human lung into the same situation in another similar animal.

Prout³⁴⁷_{June} has had an opportunity of seeing a case of *osteofibro-lipoma of the conjunctiva* occurring in a female aged twenty-eight years. After removal it was examined by Lennox,



NON-PIGMENTED SARCOMA OF CONJUNCTIVA OF LID.
(*Centralblatt für Augenheilkunde*.)

who found on section that it consisted chiefly of fat in which were numerous bands of fibrillar connective tissue. Near the centre of the tumor there was a hard mass of darker color, which was found to consist of osseous tissue, surrounded by a fibrous capsule.

Surgeon-Major Manché (collaborator at Malta) writes that he has found the following remedies very useful in the *treatment of granular ophthalmia* and its sequelæ: "1. In the first stage

of the disease, when the secretion is copious and the inflammation acute, frequent washing of the *cul-de-sac* by means of a ball syringe with a solution of bichlorate of mercury (one to one thousand) or of boracic acid (one to one hundred) is very efficacious. 2. When the congestion is less, the conjunctiva roughened, the granulations developing, and the upper half of the cornea cloudy and vascular, the best means is to evert the eyelids and touch slightly, every second day, their whole surface with the mitigated solid point of nitrate of silver, without any necessity for neutralizing the surplus. Tannic acid and glycerine, five grains (0.32 gramme) to the ounce, dropped morning and evening into the eyes, have both astringent and lubricating qualities. 3. If the case be more chronic, the conjunctiva presenting transverse bands of cicatrix and the granulations be in process of atrophy, the sulphate of copper stick or the solution of the same in glycerine, five grains (0.32 gramme) to the ounce, can be resorted to with good results."

Petresco¹⁷³_{May} has been analyzing the conjunctival secretion in cases of granular conjunctivitis among a large number of soldiers. He has found the cocci noted by other observers and a special one which differs from those described by Sattler, Michel, Neisser, and Poncet. In the treatment of chronic granular conjunctivitis, Yoakum¹⁴³_{Mar.} has obtained good results from the application of muriate of ammonia crystals and jequirity in solution. He also advocates pressure upon the trachomatous follicles. Kinney²⁰²_{Mar. 26} also has had success with jequirity in an obstinate case of trachoma. In the radical treatment of granular conjunctivitis, Harrison¹⁴⁹_{Sept.} advocates application of a solution of ten to twenty grains (0.65 to 1.30 grammes) of quinine in glycerine every morning, and a four to eight grain (0.26 to 0.52 gramme) ointment of yellow oxide of mercury in vaseline, applied in the evening after the enucleation of the trachomatous bodies. Gammil¹⁹⁹_{Apr.} very properly says that the general health of the patient should not be neglected, and states that without such treatment the local application of remedies to the eye remains ineffectual and worthless.

Wadzinsky⁷²⁵_{Mar., Apr.} recommends for trachoma crushing of the follicles, followed by vaporization with a solution of bichloride of mercury (one to three thousand) and the introduction into the conjunctival sac of sulphate of copper diluted in glycerine (one to sixteen); the use of the last solution being accompanied by the

employment of massage. (Report of Dr. Maklakoff, corresponding editor at Moscow.) In the treatment of trachoma Péounoff⁷²⁵_{Jan., Feb.} employs the radical method. He has treated one hundred and eighty cases with success, and prefers the use of the curette to any other procedure. Antisepsis is adhered to and bichloride of mercury one to two thousand to one to three thousand is used. (Maklakoff).

Burnett,⁵⁹_{Mar. 24} from observations of a very large number of eye cases among the white and colored, states that the *negro race* enjoys a comparative immunity from *trachoma*. He firmly believes that it is a race peculiarity to be classed with the dyscrasias, and should be removed from the category of purely local and contagious diseases. Jackson¹¹⁹_{Jan.} reports an instance in a negro boy of ten years of age.

Two cases, in brothers, of a rare form of *ophthalmia granulosa*, associated with *ichthyosis*, have come under the observation of Buller.¹⁰⁷⁰₁₈₆₇ They differ from the ordinary forms of trichiasis by absence of any tendency to inflammatory exacerbation, passive behavior under ordinary treatment, character of secretion more like that seen in parenchymatous xerosis, the almost healthy appearance of the retro-tarsal folds and fornix, and the almost entire certainty of non-contagiousness. He thinks that we might, perhaps, be justified in employing the designation "*ichthyosis of the conjunctivæ*" to this particular form of trachoma.

Wolfner's suggestion⁶⁵_{Sept} in reference to the value of molasses in chronic affections of the conjunctiva, especially in the granular type, is interesting and should be looked into. Based upon hearsay and the knowledge that it had been used with considerable success in interstitial keratitis, as well as in granulating ulcers, he has classed it among other irritants and has used it in nearly every case of chronic conjunctival affection. His observation led him to believe that it had "some special virtue." He drops a small quantity into the everted lower retrotarsal fold every day, or less frequently, according to the amount of stimulation the eye will bear. Alt⁸²_{May 28} challenges some of the statements by the author in his paper, which is entitled "Criticism on the Present Mode of Treating Conjunctival Affections, with Suggestions for the Use of a New Remedy." Dr. Harrison, in a short note to the editor of the same journal, says that, although not claiming anything as to its efficacy, he has often employed it, "and with happy effect," for the past

thirty years, having received the advice from Professor Gibson, of Philadelphia.

Pterygium.—The observation by Baudry¹¹²² of the frequent occurrence of pterygium among millstone cutters serves to support Horner's assertion as to the traumatic origin of the growth. Wells⁶¹_{Feb.25} cites the following case as possibly bearing on the question of Poncet's theory that "pterygium depends upon the development of a micro-organism." He operated on a lad fifteen years old who had pterygium in both eyes. The masses were crushed and lacerated with a pair of forceps and calomel applied to the raw surface. The cure was radical in both. He states that "this case, although it does not demonstrate the existence of microbes in the diseased tissues, yet offers strong inferential evidence of their presence and that they were destroyed by the germicide calomel. The lacerated tissues may have allowed access of the salt to the parasitic colonies." Dudley Reynolds¹⁹⁸_{July 28} states that in his opinion pterygium partakes of the nature of neoplasm, due no doubt to localized irritation caused by some foreign body in the conjunctiva, which, having easy access to the semilunar folds, would explain the more common occurrence of the growth on the nasal or temporal side. He advises operation before the cornea is involved. The method he deems best is to dissect the whole mass from the cornea, being careful to remove every particle. He now cuts it loose from its conjunctival attachment, and then sutures the wound, the pterygium being allowed to remain undisturbed by its basilar attachment.

Wright⁶¹_{Feb.11} practices evulsion as a means of radical cure in pterygium. He first ligates the base and then with a blunt hook and scissors gradually separates the growth from its attachment. The loose tissue is then excised close to the ligature and the remaining stump allowed to slough off. He states that in his hands the results are eminently satisfactory. Hobby³⁴⁷_{Apr.} incises the conjunctiva along the upper margin of the growth and extends a vertical incision from it at the margin of the cornea. After dissecting the pterygium from the cornea, a downward incision is made in line with the vertical one. A longitudinal incision along the under margin is then continued from the vertical one and carried around the base of the growth to meet the upper one, and the mass is carefully dissected off. The upper flap of conjunctiva is freed by means of a strabismus

hook, and, lastly, the flap is brought down and secured by two stitches. Cutter³⁴⁷_{May} says that this is the operation he nearly always makes, having learned it from his preceptor, Calhoun, and that he has employed it for about five years. Dibble¹⁰²_{Nov.} has operated on eight cases of pterygium by evulsion with strabismus hooks, and has obtained far better results from this plan than from any other method. Chisholm¹⁹_{May 19} reports three cases of pterygium covering almost the entire cornea and starting from the inner canthus, the external canthus in all cases being free from any complications. He cites them to prove that they can start from the inner canthus alone and extend sufficiently outward to shut out sight by covering the cornea.

Marlow¹_{Aug. 25} cites the history of a case of pterygium in which, although the growth had not encroached on the pupillary area, there was decided diminution of vision, which was markedly improved after removal of the growth. He states that "the obvious explanation of the change of refraction and visual acuity is that the drag upon the corneal tissues by the pterygium produced irregular astigmatism, and that when the pterygium was removed the regular corneal curve was resumed." He therefore advises early operation in these cases, especially where there is impairment of vision, though the growth does not reach the pupil.

According to Emmert's¹⁹⁰_{Mar.} investigations, extending over ten years, the so-called *spring catarrh* (*frühjahrskatarrrh*) is most prevalent in June and July. He has made careful studies with the microscope, and, on account of the pathological change being generally associated with the season at which it is most prone to occur, he proposes the more exact term of *hypertrophia epithelialis aestivis*.

Dr. Maklakoff (corresponding editor in Moscow) states that Roumchevitch⁷²⁵_{July, Aug.} had a case of *hypertrophy of the semilunar fold*, which in great portion was infiltrated with calcareous depositions.

Littlejohn's¹⁵_{Oct.} wise suggestion for the prevention of ophthalmia among school-children may be summarized as follows: 1. The division of those attacked into small groups. 2. The appointment of a sufficient number of experienced nurses. 3. Abundant open-air recreation for those attacked. 4. A system of clean rooms which shall avoid damp boards as the result. 5. Abundant ventilation, especially of dormitories, artificial warmth and extra

clothing being utilized when needed. 6. Improvements in bathing and washing, including the provision of large open-air baths. 7. The washing and disinfection of each towel after use. 8. More "outing" in the country lanes, etc., during half holidays, together with the provision of means for exercise and games. 9. Such arrangement of seats in the school-rooms that there shall be no strain on the eyes, and that the sun's rays shall not fall directly on the eyes.

In *purulent ophthalmia* Dabney⁸²_{Nov.10} finds cold applications to be more agreeable to the patient and at least as effective as heat, but thinks the latter is decidedly to be preferred where the cornea is implicated or ulcerated, on account of the liability of cold to further depress the condition of the tissues.

A peculiar pathological condition of the eye which exists among the lower classes of the Southern States, especially negroes, is described by Wurdeimann⁵⁹_{Oct.6} under its popular name, "*the tea-leaf eye*." It is produced by poultices and preferably by one of tea-leaves. The symptoms are characteristic, and should the poulticing be continued panophthalmitis develops quickly. Treatment consists in cleanliness, cocaine and atropine, cold compresses, varying solutions of nitrate of silver, leeches to the temples, and rest in a darkened room. Six cases serve as illustrations.

Reynolds¹⁹⁸_{Feb.} has repeatedly demonstrated the presence of *staphylococcus aureus* in the muco-purulent types of conjunctivitis. He speaks of the credit due to Doctors Williams and Hays for demonstrating the superiority of salt and borax solutions over astringent agents.

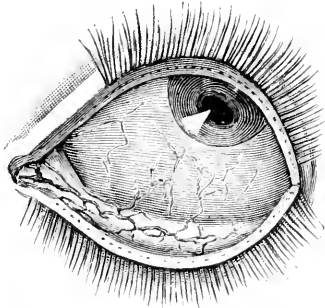
Poncet¹⁰_{Jan.} finds three forms of ocular lesions in leprosy: (1) leonine, or tuberculous; (2) autonine, or nervous; (3) lazarine, or ulcerous—the last probably resulting from the others. The disease creeps inwardly from the exterior. Careful study should be made of these observations.

Perlia's case³⁴_{Feb.21} of *spontaneous hemorrhage from the normal conjunctiva* of a seventeen-year-old girl, who had suffered from the affection since two years of age, is interesting. During the bleeding there was localized venous engorgement, as is shown in the cut on the next page. The attacks came on from overexertion, especially when stooping, and were more marked at the menstrual epoch.

C. Smith,⁴⁰_{Jan.} has seen good effect from antipyrine in acute inflammations of the conjunctiva and cornea.

Fuster¹⁴⁵_{Mar.} describes a case of *melano-sarcoma of the conjunctiva* in a fifty-seven-year-old man. (Report of Dr. Chiralt, Seville, Spain.)

Snell⁷⁶_{May} believes that massage will be found useful in most cases of chronic affection of the conjunctiva and cornea, and thinks that those who adopt it will find it a remedy of distinct value.

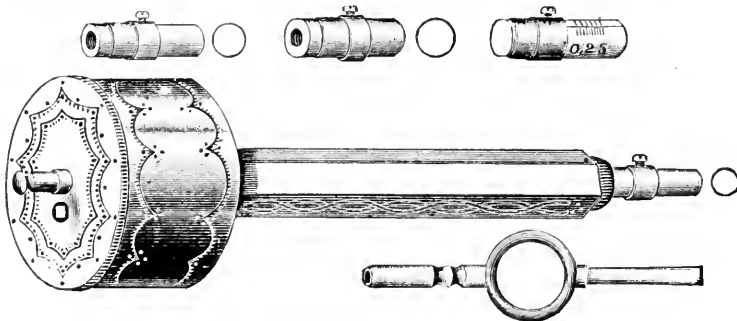


(*Münchener Medicinische Wochenschrift*.)

DISEASES OF THE CORNEA.—

Von Hippel's operation,²⁰⁴_{B4,24,H.1} as well as the researches of Adamuck in 1887 and Revelli in 1883, which were described in brief in last year's ANNUAL, have assumed so much notoriety that it has been thought best to give a short, detailed *résumé* of the operation. Von Hippel first described his operation in 1886, in

which he refuted the conclusions reached by Neelsen and Angelelli. In opposition to their opinions, he found that the transplanted graft very seldom perishes, and that sufficient nutrition for its life is obtained from the peripheral margin, without any



VON HIPPEL'S TREPHINE.
(*Medical and Surgical Reporter*.)

necessity for contact of the posterior surface. Unfortunately, it was found that, whatever precaution was taken, the graft soon became dim through swelling of its tissues and cast off its epithelial layer by entrance of the aqueous humor. Pursuing his studies, he found that the curling of the edges of Descemet's membrane in both the graft and the living cornea were never

properly adjusted. This difficulty caused him to devise an instrument by which absolutely similar areas could be made. Following Leber's discovery that transparency is dependent upon the intactness of Descemet's membrane, he decided that it must be preserved, and in consequence limited the depth of his incision down to the membrane itself. Several operations done by this plan gave negative results, which induced him to substitute the entire thickness of a thinner cornea for grafting purposes. This proved much more satisfactory. After ascertaining the depth of the leucoma, a trephine provided with clock-work driven by a spring, so arranged that a circular knife can be graduated for any desired depth (*vide* figure), is wound and made ready for operation. The procedure is divided into four portions: (1) the introduction of the trephine; (2) the excision of the trephined portion; (3) the removal of the entire thickness of the corresponding piece of the rabbit cornea; (4) the transplantation of the graft to the human eye. Strict antisepsis is observed throughout the entire procedure. Four out of eight cases were successes. In conclusion, the author assumes that the possibility of transplantation with useful visual results is proven, and says that as the operation is safe and occasions but little suffering, the procedure may be tried wherever there is reasonable hope of success, even if the leucoma should affect the entire thickness of the cornea, taking care, however, to omit from such operative interference the adherent or staphylomatous type of the disease. Wangenmann,²⁰⁴_{Bd.34,H.1} after a series of experiments upon rabbits, claims that reapplication of the trephined portion of the cornea reunites and retains transparency, from which he concludes that the local action of the aqueous is not absolutely nugatory to success.

Fox¹⁹_{July 21} reports a case operated upon by him in April of 1888. The patient, a female aged nineteen, had "parenchymatous opacities" which "extended throughout the entire corneal tissue to within one millimetre of the corneo-scleral margin, the greatest density being in the centre opposite the pupil. Vision, *nil*; light perception and projection good, but movements of the hand not recognized. The left eye was in like manner affected," but in less amount. The patient is said to have been "free from hereditary taint." During the progress of the case, it is noted that "owing to a nervous shock, a sudden keratitis developed, which was

promptly checked by antiphlogistic measures." "In three months' time the union of graft is perfect, its integrity preserved and covered with corneal epithelium; transparency of graft progressing—central vision increased to counting fingers at four feet; able to attend to personal wants and go about alone in safety; color perception keen." It is of great interest to note the following observations made in this case: "In looking across the apex of the cornea, one is able to look into the transplanted tissue, proving a clearing down to the middle layers of the graft. If this process of change continue—and we have every reason to believe it will—we shall have the same result that von Hippel has obtained. The cornea surrounding the graft has recently begun to clear, which may become more and more extended, leaving only a narrow circle of connective tissue between the graft and cornea."

This case was followed by a double operation ¹⁰⁴_{June 30} by Chisölm. Both grafts held, probably aided, as the author suggests, by the liberal supply of blood from numerous granulations which had previously formed upon the cornea, and which entirely covered the surface. Vision, which had been reduced to light perception, gradually improved in two weeks' time to the detection of "large objects as they move several feet in front of him." He promises further details of the progress of the case.

Strawbridge ⁹_{Dec. 15} adds two new cases to the list. He pertinently remarks, however, that "if reference is made to von Hippel's article it will be found that the author admits that this operation is only adapted to partial corneal leukoma (a condition, in my judgment, not warranting the operation). In fact, I should consider it never indicated if an iridectomy could be substituted for it; but in those cases in which the cornea has become opaque in its entire diameter, with adherent iris, and in the staphylomatous corneæ, the operation is not advised. Now it is in these cases, and in others in which the natural passage of light to the retina is prevented by the destruction of cornea, iris, lens, and ciliary changes, that some operative relief is so much needed, and as yet no treatment has been proposed."

It is to be hoped, in view of von Hippel's large and painstaking investigations, together with his carefulness in waiting a sufficient time for correct and legitimate conclusions, that careful and conscientious experimentation, both in the laboratory and the

clinic-room, may be combined until absolute determination has been made whether or not the procedure can be placed upon a sufficient basis to make it one of the standard operations in ophthalmic practice or not.

Hall, of Yokohama,¹³⁰ gives his experience with the use of galvanism for the removal of corneal opacities, both recent and old. Nine cases that he has had under treatment have all shown decided improvement. He generally applies the cathode as the therapeutic pole, but if the eye becomes congested he prefers the anode.

Fracture of the cornea from the "kickback" of a fragment of a whip-thong is reported² by Solomon. Percy Dunn² Apr. 14 has also seen a similar case. Recovery of vision was obtained in each instance.

Ritter²⁰⁴ July, Aug. has had exceptional opportunity, by being in a rural district, to study the effect of foreign bodies of an animal or vegetable nature (grains, insects, etc.) imbedded in the cornea. They soon become covered by microbes, which he has used for culture experiments. Straub¹⁹⁰ Mar. employs one drop of a one-half per cent. solution of "fluoresceine" in the diagnosis of small and otherwise imperceptible breaks through the corneal epithelium, the underlying corneal elements themselves being stained a greenish tint, whilst the epithelium remains uncolored. The coloration remains but a couple of hours and seems to do no harm. Trousseau's *treatment*³⁵ Mar. 6 of *phlyctenular keratitis* in children consists in the introduction of small pieces of yellow oxide of mercury ointment (three parts mercury ointment to five hundred vaseline) once daily into the eye and compresses wet in a warm solution of boric acid for a quarter of an hour at a time. Keyser⁶² Dec. 1 has succeeded in effecting a cure of obstinate corneal ulcer by the use of iodoform ointment. Borck⁵¹⁴ Nov. extols massage in various inflammations of the cornea, and thinks that recovery is much more rapid and relapses less frequent when it is employed in connection with the usual treatment. Eserine instillation as a remedial agent in corneal ulcers is recommended⁵⁹ by Herbert Harlan.⁵⁹ V. 1, p. 890 The majority of eighteen cases cited by him were either "positively benefited" or presumably, from various causes, "required no further treatment." The best results were obtained in those due to injury from oyster-shells,—“oyster-shucker's corneitis.” He believes that the good results are due to relief of the photophobia by contraction of the pupil and lessening of danger

of rupture by decrease of intraocular pressure. He judiciously adds that the drug should never be used in cases complicated by iritis.

Eugene Smith⁴²⁶ has frequently resorted to jequirity in the *treatment of abscesses and the various ulcerations of the cornea*, and has found that in several cases where the extent of the purulent collection and the character of the case seemed to forbid all hope of saving the eye, or even a sufficiently large portion of the cornea for an artificial pupil, yet in each case recovery has taken place with the resulting opacity so thin as not to call for operative interference. He inclines to the belief that this very remarkable absence of scar-tissue is due to the checking of corneal corpuscle proliferation and segmentation, with increased nutrition from the development of numerous fine blood-vessels. He employs it in very small doses, just sufficient to produce a catarrh or a slight degree of the membranous characteristic.

Fergus²¹³_{Mar.} lauds the use of the vapor of iodoform in the *treatment of purulent ulcers of the cornea*. The eye, which has been previously cleansed with some antiseptic solution, is freely dusted over its entire surface with a compress impregnated with iodoform, and a bandage applied. These applications are repeated sufficiently often to keep a constant vapor of iodoform in contact with the ulcerating surface. He enjoins great care to avoid overstimulation. In cases where there is a sloughing condition of the cornea, the slough is to be removed with a sharp spoon.

Callan⁹_{Oct. 6} recommends an additional method of *treatment of ulcerative keratitis* by cleansing the ulcer and then thoroughly swabbing it with a 2 per cent. solution of nitrate of silver. The eye is to be cocainized. The procedure should be repeated daily.

Tiffany⁷²_{Sept.} advocates the use of the electro-cautery in various forms of keratitis. He also speaks very enthusiastically of its use in the treatment of trachoma. Where the granulations are not so numerous he uses a pointed electrode and applies it to each individual granule, "cremating it level with the conjunctival surface." If the growth be dense, he applies a flat electrode. The after-treatment consists in the application of an antiseptic compress and bandage. In contradistinction to this, Wolfe, of Glasgow,²⁶_{Oct. 1} protests against the use of the cautery in diseases of the cornea on the ground that a burn cannot be limited in its extent, and that he has witnessed many disasters resulting from its use.

Mittendorf¹⁰¹_{Jan.} has had happy results from the use of the electro-cautery in obstinate and dangerous ulcerations of the cornea. Abd-el-Kader-Benn-Herim¹¹²³ has made some observations upon the different treatments of *hypopion keratitis*, and thinks the galvanocautery gives better results than all other methods.

Hourly flooding of the eye with one to five thousand bichloride solution has given Hotz⁶¹_{Dec.17} excellent results in twelve cases of hypopion keratitis. As the hypopion lessens, the frequency of the irrigations is decreased. The use of the same drug in one to four thousand and one to eight thousand solution in the treatment of hypopion keratitis and other corneal diseases is extolled by Chilton.⁸⁵_{Aug.} In all cases of suppuration in the anterior chamber J. H. Stewart¹⁵_{Oct.15} washes out the cavity with one to ten thousand sublimate solution. He makes an incision into the cornea in its most dependent part to allow for drainage. He does not hesitate to cleanse the anterior chamber when it is filled with blood. Kuritzyn⁷⁶_{May, June} records a case of ulcers of both corneæ resulting from prolonged exposure to cold winds. The corneæ had sloughed, leaving two nearly round ulcers situated symmetrically in both eyes. The ulcers healed under treatment in three weeks.

St. John Roosa¹⁹¹_{Apr.} gives the wise counsel, which is so apt to be forgotten, that in all cases of keratitis, except the traumatic variety, dietetic management must be one of the chief therapeutic resources at command.

Randolph⁵_{Dec.} has observed two cases of *congenital clouding of the cornea* affecting sisters. He is inclined to refer them to intrauterine inflammation, and prefers to regard the congenital and the post-natal forms as ætiologically and pathologically the same.

Dujardin²²⁰_{May 25} claims the cure of a case of *partial staphyloma corneæ* from a neglected strumous keratitis in a young child by an equatorial sclerotomy.

In the *removal of staphyloma corneæ*, Thompson⁷⁶_{June} recommends that a curved needle threaded with horsehair be passed through that portion of the staphyloma which it is intended to remove, as the loop affords a ready means of steadying the eye whilst the elliptical incisions are being made, and removal of the remaining portion. Williams⁷⁶_{Oct.} advocates the use of the actual cautery in cases of conical cornea upon account of extreme simplicity, freedom from danger, and good results.

Scott and Storey⁷⁶_{July} report a questionable case of *corneal fibroma*. The growth seemed to occupy the position of the true cornea, and was composed of connective tissue holding numerous blood-vessels and groups of nuclei.

Antokonenko⁷²⁵_{Jan.,Feb.} reports a case of *dermoid tumor of the cornea*. It was removed and the point of position burnt with the thermo-cautery. (Report of Dr. Maklakoff, corresponding editor at Moscow.)

Specimens and sections of a case of *epithelioma of the cornea* occurring in a man aged fifty-seven years were shown to the Manchester Pathological Society²_{May 19} by Emrys Jones and Peter Fako. The eye was enucleated. The tumor was found to be of the tubular type with the cells arranged in tracts or cylinders, the stroma being composed of partially formed fibrous tissue. At the surface there were a number of small cysts. The history was that three years previously the patient had suffered from phlyctenular conjunctivitis, with vesicles along the edges of the cornea. The man died of cancer of the neck one year after the enucleation of the eye. A *cicatricial fibroma of the cornea*,³⁵³_{Aug.} following violent inflammatory action, has been seen in a child by Silex. Bernheimer²⁵¹_{Dec., '87} has made studies with the microscope of the tissues of a congenital staphyloma of the cornea in a six-month-old infant. The structure appeared dermoid in character.

Antoine J. Panas¹¹²⁴ gives us an interesting contribution to the study of *primitive tumors of the cornea*. He concludes that such tumors are definitely demonstrated, and advises cauterization if they should be small and superficial, and ablation of the anterior portion of the globe if they tend to provoke trouble in the deeper tunics.

Bock³⁵³_{Apr.} has described a pigment mass of doubtful nature, which he found floating in the anterior chamber of the left eye of a nineteen-year-old patient who had died of pneumonia.

DISEASES OF THE SCLEROTIC COAT.—Webster¹⁰¹_{Jan.} has had much success in the treatment of *episcleritis* by the use of the actual cautery. He cites three cases which, having resisted all other remedies, were cured within a short time by the additional use of the cautery.

Convinced from personal experience of the absolute necessity in von Hippel's operation—if it is to be usefully done at all—"to

trephine inwardly until a transparent media is reached, even if it is necessary to enter to a considerable depth," Strawbridge⁹_{Dec.15} is induced to ask, "Why not boldly *trephine through the sclerotic coat posterior to the ciliary bodies?*" Six experimental operations were made upon rabbits' eyes. After antiseptis, the conjunctiva was dissected loose and inverted, and the rectus muscle divided. A von Hippel trephine was employed to make the scleral opening, after which the conjunctival flap was stretched across the opening and stitched to the conjunctiva at the corneal border. In five weeks' time the scleral opening appeared like dark pupils through which light could be reflected. He says: "It is, therefore, fair to say that these experiments (as far as rabbits' eyes are concerned) prove that a large scleral pupil can be maintained without the least tendency to contract, and that the conjunctival covering will attain again to the normal transparency, and through this opening light can be reflected; also, that the eyeballs are not damaged." He then carried the procedure to human subjects, the only change in the *technique* being the substitution of the use of a dental-engine motor power. Two operations were made, but sufficient time had not elapsed up to the time of writing the paper to give any definite results. He thinks that the scope of the scleral operation is:—

"1. As a means of making an artificial pupil in eyeballs now considered hopeless, for the purpose of giving vision.

"2. It will be probably an efficient means of reducing staphyloma anterior by making a permanent opening through which osmosis of the eyeball fluids may go on without injury, and in this way prevent intraocular pressure.

"3. As a means of combating glaucoma in the chronic stages, by allowing free osmosis through the conjunctiva and the scleral opening.

"4. It may be useful in retinal attachments by its ability to drain the retinal sac of its fluids through the scleral opening, and by keeping up osmotic action lessen the risk of a reseparation."

DISEASES OF THE IRIS.—Ayres¹²_{Aug.} has noticed that in New Orleans his cases of iritis are of much shorter duration (average of eight cases 12.6 days) than at other places where the relative *humidity of the atmosphere* is greater, and to this cause he ascribes the difference. Hirschberg⁶⁹_{Oct. 25} has in twenty years seen between three

and four hundred cases of *syphilitic iritis*. Three or four cases occur in every thousand cases of ocular disease. He has seen cases in which the disease appeared as early as four to six months after the infection. The incipient symptoms are generally very insidious, and consist in subjective sensations of light rather than failure of visual power. Almost every part of the eye is more or less affected. The retinitis may be monolateral. Treatment is of long duration, and the disease may frequently relapse. Grossmann⁷⁶_{May} had a case of a *cyst-like formation*, seemingly derived from the iris and attached to the anterior capsule of the lens. As an iritis was evident, atropia was instilled. The cyst burst and absorption followed. The author advises puncturing such cysts before proceeding to more heroic measures. In iridectomy, Abadie,¹⁷¹_{June} instead of drawing the iris out and stretching (perhaps tearing) the fibres, so that the resultant coloboma is irregular and misplaced, makes two incisions four to five millimetres wide, one above and the other below. The de Wecker ciseaux-pincers are then introduced into the lower section, and the pointed branch is slipped beneath the iris. Incisions are now made to the right and the left, thus circumscribing the summit of a triangle. The forceps are now introduced from above, the flap is withdrawn and is cut squarely off by a third snip. In this way a large, gaping opening is formed, with the apex of the triangle directed downward.

Andrews¹⁵¹_{June} reports a case of *primary sarcoma of the iris* which was entirely removed by iridectomy. The eye was lost, probably owing to failure of antiseptic precautions (and consequent secondary infection) during the operation.

DISEASES OF THE CILIARY BODY.—Mules,⁷⁶_{Apr.} in a paper upon *ciliary tumors*, emphasizes the importance of a diagnosis between ciliary and iritic tumors. If the tumor be of the iris immediate excision is imperative. Differential diagnosis between early ciliary staphyloma and tumor is assisted by the use of a beam of light. The use of acupuncture to differentiate between intraocular tumors and retinal separation is deprecated as dangerous. McHardy,⁷⁶_{Apr.} asserts that when there is detachment of the retina, with intraocular tumor and diminished tension, the tumor has had its origin in the ciliary body. Schiess-Gemuseus²⁰⁴_{Bd.34, H.3} had a case of a *connective-tissue neoplasm of the ciliary body* simulating a tumor, that, despite the failure of any history of traumatism, he thinks must have been

due to an old wound from some needle or fine-pointed body. Peripheral, lenticular, and the vitreous opacities are explained by disturbances in the circulation. Fienuzal and Haensell³³⁴₈₈ give an exhaustive analysis, clinical and anatomical, of a *leucosarcoma* of the ciliary body. From this it appears that the neoplastic cells arose in the neighborhood of the vessels, and that the ciliary and choroidal tissues in which the tumor developed served as an inciting or stimulant agency in the cell division. Alt³⁴⁷_{Nov.} tried to remove a small tumor of the iris that subsequent enucleation proved to be connected with a larger one of the ciliary body, upon which it sat like a nipple. It proved to be an *unpigmented spindle-cell sarcoma*. Müllerheim¹¹²⁶ gives the details of nine cases of *accommodation spasm*, whence he argues that there are two kinds, one tetanic and the other intentional. He says that the phenomenon is related to progressive myopia, and in certain cases it checks the myopia by resolution of the spasm, and that with this resolution there is an increase of visual acuity.

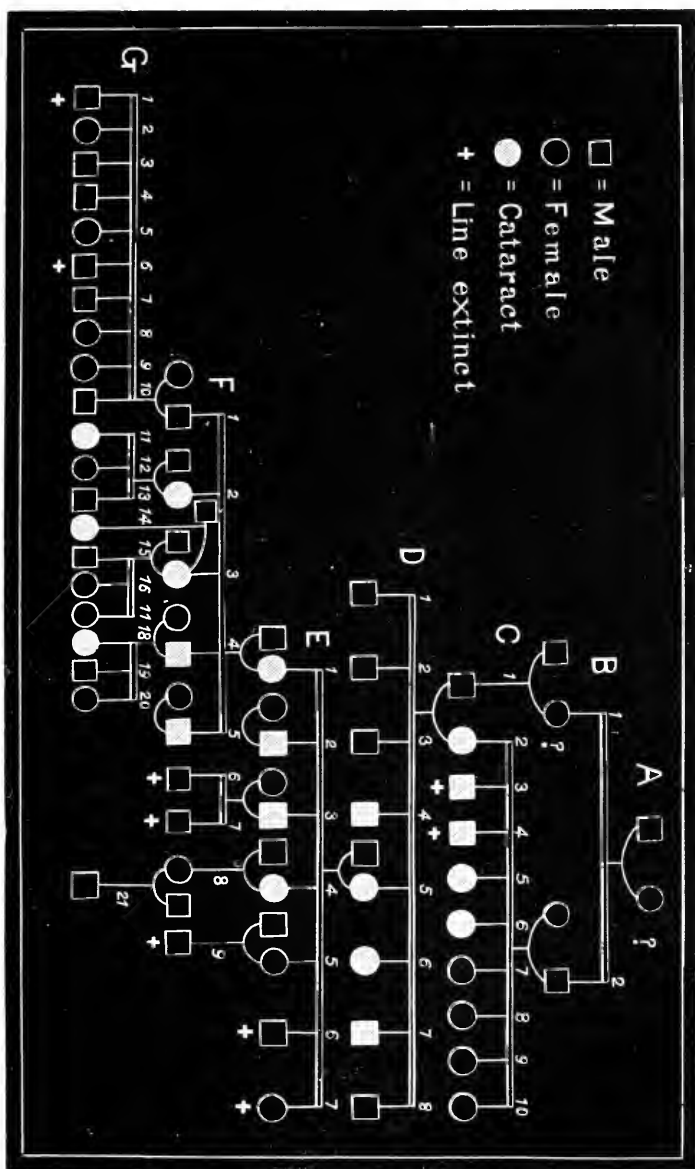
DISEASES OF THE LENS.—Among five hundred patients, Lopez, of Havana (report of our corresponding editor, Dr. Chiralt, of Seville, Spain), has found seventeen cases of green reflex of the crystalline lens. One was found in iritis, one in retinitis, two in choroiditis, three in cataracts, nine in glaucoma, and one in a physiological eye. An instance of the extremely rare condition, *lenticonus posterior*, is described by Meyer.¹⁹⁰_{Feb.} Faravilli and Gazzaniga³⁰_{v.17, No.2} describe a case of *ossification of the lens*. Webster³⁴⁷_{July} had an interesting case of *calcareous lens*. The results of Schoen's studies²⁵⁴_{Bd.19, H1} concerning the *etiology of gray cataract* are thus given by the author: 1. The process heretofore described as senile cataract always begins as equatorial cataract with fine white points and striæ, but not by fissures. 2. Nuclear sclerosis never occurs without equatorial cataract, statistics showing three hundred and seventy-seven cases of the latter without the nuclear sclerosis, thus proving the secondary character of the last. 3. Nuclear sclerosis follows equatorial cataract only after the sixtieth year (twice) or the seventieth year (twelve times). 4. More than half (60 per cent.) preserve normal visual acuity, which proves that central lenticular changes have not taken place. 5. Anterior cortical cataract follows the equatorial variety more frequently only after the fiftieth year. 6. Cataracta simplex is not a manifestation of senility,

since it often occurs in an incipient stage in the young of twenty or thirty years. The designation, *senilis*, should, therefore, be displaced by that of *simplex*. 7. Three-fourths of all cataractous eyes are hyperopic or astigmatic. 8. Equatorial cataract usually begins in the horizontal meridian. 9. The microscopically visible points and striæ correspond exactly to the insertion of the anterior and middle zonular fibres and in a sense marks them out. 10. The microscopical changes are likewise arranged about the foot of these fibres.

From all this the conclusion is drawn that accommodation strain is related to the origin of simple cataract.

Magnus⁶⁹_{Oct.4} ascribes to the accommodation changes of old age the origin of cataract, since these indirectly condition the nutrition of the lens. He says the nutritional current is regulated by the accommodation, which grows constantly weaker with age. From denutrition arises the shrinking of the lens fibres and proliferation of the lens epithelium. Berry⁷⁶_{Jan.} has found an instance of marked heredity in a form of cataract developed in early life. In the appended table, the generations are marked A, B, C., etc., and the numbers of each generation according to seniority, 1, 2, 3, etc. Squares denote males, circles females, and the known cases of cataract are white. The transmission was more strongly marked through the female lines. No other disease except cataract was transmitted at the same time. A point of general interest is the fact that the cataract cases appear in succession, and notably showing a tendency to inheritance from the mother at one particular period of child-bearing life. In no instance did the eldest girl escape. Hosch²⁴_{Oct.1} also communicates an instance of heredity of cataract. Our corresponding editor, Dr. Chiralt, of Seville, Spain, describes two instances of inherited cataract that came under the treatment of Dr. Ocana. Beselin²⁵_{1845, Oct.1} has made a microscopical examination of a *zonular cataract*, and has found the opacification to consist of two layers separated by normal fibres. The opaque strata were composed of fissures filled with *débris* and cataractous fibres. It is concluded that the opacity is due to a chemical alteration of the external strata when the lens was being formed, and that the transparent layers are of a more recent formation. Lawford⁴²³_{July} communicates the results of microscopical examinations of three lamellar or zonular cataracts. He is unable to determine from

these whether the cataract is due to a developmental defect, or some nutritive change in early infantile life.



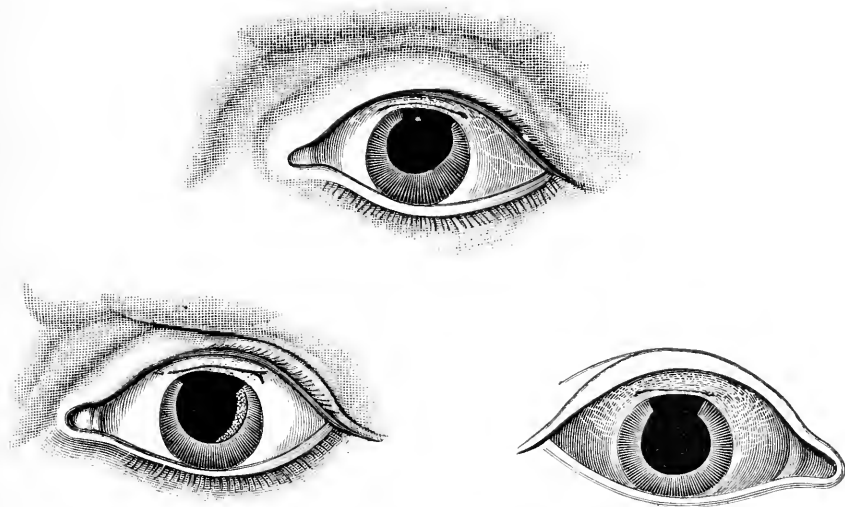
BERRY: HEREDITY IN A FORM OF CATARACT DEVELOPED IN EARLY LIFE.
(*Ophthalmologic Reviews*.)

Nicati¹⁵² reports the spontaneous liquefaction and absorption of a double cataract within two years in a man of seventy-eight years of age. Visual acuity is said to have been perfect after the

correction of a myopia of 9. D. A case of (probable) liquefaction and spontaneous absorption of a cataract is reported to have occurred in the practice of Dr. Ocana, of Madrid, by Dr. Chiralt (corresponding editor, in Seville, Spain). Sous¹⁸⁸_{Dec.18} properly thinks that the existence of epilepsy is not a contra-indication of successful cataract operation. He reviews the history of the subject and details a successful case of his own. Schirmer²⁰⁴_{Bd.34,H.1} has made experimental studies of Förster's method of artificial maturation of cataract upon fifty-two rabbits. In only six cases was there failure of opacification. In ten cases there was total cataract. In none was there rupture of the capsule. All the lens-fibres were influenced and there was a displacement of the layers and fibres. The nucleus showed no changes, but the spaces produced by the displacement were enlarged and filled with cellular infiltrate. The fibres swell and burst, discharging their contents beneath the capsule. Neither cornea nor iris are injured by the massage. Secondi³⁰_{v.16,No.5} has had sixteen successful cases of artificial maturation of immature cataract according to Förster's method. Wolfe²⁶_{Sept.1} uses neither chloroform nor cocaine in cataract operations. His objections to cocaine are: (1) that it renders the tissues white, so that sometimes it is difficult to see the point of junction of the cornea with the sclerotic; (2) as it is essential to the healing by primary union to have all the tissues in a physiological condition, he objects to put them in a pathological state; (3) that the drug is not altogether free from danger, and has in many cases already manifested its toxic effects. Those wishing, in cataract operations, to carry asepsis and antiseptis to their most rigorous extremes should read Hirschberg's description⁶⁹_{No.38} of his four-fold apparatus for obviating infection by means of steam, chemicals, hot air, and hot water. Jacobson's polemic²⁰⁴_{Bd.34,H.1} is to the effect that the world has unwittingly cast aside the true von Graefe operation whilst constantly "improving it" and calling it after von Graefe. The true von Graefe section must be not more than one millimetre from the scleral border; it must exceed the width of the greatest lens by about two millimetres, and the cataract must be expressed by a delicate vertical upward force under the lower border of the lens without rupture of the zonula or hyaloid membrane. Schweigger²⁵¹_{Bd.18,H.2} contends that the linear section in cataract operations is apt to be followed by gaping of the wound, iris and vitreous prolapse. He asserts that the

coercion of facts compels us to abandon it, as he has done, for the modified flap section. He shows some von Graefe reproductions (see cut annexed) from nature of the appearance of the results of the original von Graefe methods of section. In returning to the flap operation he also gives up the von Graefe knife and adopts one with a triangular blade, seven millimetres wide and thirty millimetres behind the point. The corneal flap is four millimetres in height. The iris is, of course, not mutilated. Eserine is used at the completion of the operation and at the first dressing, and atropine after the third day.

The discussion of the question of the advisability of the simple



SCHWEIGGER: RETURN TO THE FLAP OPERATION.
(*Archiv für Augenheilkunde.*)

method of cataract extraction has been kept up this year with great vigor. The general result is still favorable to the omission of the iridectomy, and the "return to the flap" seems also to be gaining adherents. Frothingham,⁶¹ Ayres,¹⁹⁸ Burnett,⁹ Haltenhoff,¹¹²⁵ Panas,²⁷⁴ all write in favor of it. Schweigger,²⁰⁴ in answer to Jacobson, emphasizes the fact of the exaggerated idea of the value of an *iridectomy* for obviating inflammation that was widely prevalent in 1862, and which in great measure led to its adoption as a part of the operation of cataract extraction. According to our corresponding editor, Dr. Landolt, the balance of testimony among French surgeons is in favor of abandoning the

iridectomy in the operation for cataract. Gayet, in his report to the International Ophthalmological Congress of Heidelberg, ²⁷¹_{Sept., Oct.} states that three-fourths of those operated upon recover without a coloboma of the iris and with a round pupil more or less free. The incision in the corneal limbus is preferable, but not by any means invariable. The flap is the best incision, and its size must be proportioned to that of the lens and its consistency. The iridectomy is not necessary and is rarely useful. He freely washes out the anterior chamber with sterilized water, aided by massage. Referring to the experiments of Gayet, in which he proved that three-fourths of the conjunctival sacs after being thoroughly washed with antiseptic and aseptic solutions, yet contained microbes at the time of operation, Abadie ²⁷⁴_{Jan.} argues against the iridectomy in cataract operations, and also against prolonged attempts to reinsert a hernia of the iris. He says that it is better to excise the protruding part. Alfred Graefe ²⁰⁴_{Bd. 34, H. 3} protests against the omission of the iridectomy on the ground of the greater danger of iris-prolapse. In answer to Knapp's statistics, he says that, although discharged, many of Knapp's patients leave with anterior synechiæ, which must always remain a source of danger. Hasket Derby, ⁹⁹_{Feb. 23} in arguing against the *simple operation*, reports some unfavorable results in forty-eight cases operated on by this method in Boston during the last three years. Knapp, ⁹⁹_{Apr. 5} in reply, refers to the results of other operators, notably of Bull and himself, and emphatically says that, "neither in excellence nor safety can the von Graefe method compete with simple extraction." Rodzewitch, ⁷⁸_{Sept.} in performing one hundred cataract operations, used the de Wecker method in fifty-four cases and the von Graefe method in the balance. The results are given as good in ninety-six cases and bad in four, with no case of panophthalmitis. The good and bad results were equally divided between the two methods. Prolapse of iris was more frequent in simple extraction, but visual acuteness was higher. Knapp ²⁵⁴_{Bd. 19, H. 1} now bases his conclusions as to the advantages of the simple extraction upon a report of one hundred cases. He reaffirms his conclusions reached in a previous report (see ANNUAL, vol. iii, p. 51). Classifying the visual results, he finds 96 per cent. to be good, 3 per cent. medium good, and 1 per cent. loss. He has definitely adopted the method for all but the few exceptional cases in which an iridectomy is indicated in advance.

Rydel²⁶_{Oct.1} from 1869 up to the end of 1885 has been practicing von Graefe's method of extraction, the total number of the operations of the kind being seven hundred and ninety-six, of which seven hundred and fifty-nine were successful, and but thirty-seven (4.65 per cent.) failures (that is, ending in the loss of the eye). Since January 1, 1886, he has been employing a peripheral flap method, with iridectomy. Of two hundred and four cases operated upon in this way, one hundred and ninety-seven proved successful, and only seven (3.43 per cent.) gave failures. The superiority of the latter method becomes still more obvious if we add that of one hundred and eighteen cases operated upon by him from January 1, 1888, up to April 6, in one only was the eye lost. The remaining one hundred and seventeen were successful.

Mooren, Galezowski, and Manolescu⁴⁶² indorse the simplified method of cataract extraction, and detail their methods of carrying out the same in different forms of cataract and of meeting the complications that may arise.

In order to determine the relative value of removal or not of the capsule, Pagenstecher²⁰⁴_{Oct.31,11.1} since 1876 has in seventy-four cases of double cataract operated upon the one eye with removal and upon the other eye of the same person without removal of the capsule. The former method is better for overripe, morgagnian, shrunk, luxated, and chalky lenses, and in cases of prolapse of the vitreous. The last complication happened in thirty-nine cases with removal and in five without. This is not considered a serious matter or as tending to produce retinal detachment. The visual results are brilliant in either case, but particularly so in the cases with removal. In general, the results seem to point in favor of removal of the capsule.

Dr. Landolt writes us that, in the extraction of cataract, irrigation of the anterior chamber is still in favor, though the operation is being restricted to more reasonable limits. Panas advises (as Gayet formerly did) that the amount injected should be limited to a few drops of liquid, the sole purpose of the same being disinfection and not cleaning out of the anterior chamber. The *débris* should be removed by mechanical means. Gayet uses a fine jet of warm sterilized water without pressure and directed toward the wound, which opens and allows the water to enter and circulate in the anterior chamber. Panas uses a saturated solution

of boric acid, and finds it less irritating than mercurial antiseptics. In 1887, he used irrigation in one hundred and fifteen cases without a case of suppuration. McKeown,^{2 Jan. 2} the proposer and advocate of the method, gives the statistics of the last one hundred cases thus operated upon. He had three cases of complete loss. He freely uses tepid boiled water, and does not hesitate to use considerable force in washing out sticky cortex, etc. In very immature cataracts he does an iridectomy, but not in the mature ones. He finds no positive disadvantage from the eserine injection of de Wecker. Lee and Bell,^{2 Feb. 11} are enthusiastically in favor of the method of McKeown. It must be remembered that McKeown claims as a decided advantage that it allows an earlier operation in immature cataracts than is otherwise admissible. Panas^{10 Jan. 31} gives, as a result of his three years of operation without iridectomy and with irrigation of the anterior chamber, the following figures:—

23	cases of entanglement of the iris,	. . .	= 5 per cent.
2	“ “ suppuration with total loss of vision,	. . .	= 0.4 per cent.
31	“ “ insufficient vision, . . .	. . .	= 6.7 per cent.
427	“ “ complete vision, . . .	. . .	= 92. per cent.

Webster^{249 Mar.} had a patient who in a fit of dementia tore the bandages off the second day after cataract extraction, and repeated the act the following night. Chemosis developed the fourth day, panophthalmitis the eighth, vomiting with loss of power over the sphincters on the twelfth, and death from meningitis ensued on the twentieth day after the operation. Fano^{253 Jan.} did an iridectomy in a case of double lamellar cataract in which only the peripheral portion of the lens uncovered by the iridectomy remained transparent. He found that for distinct vision the eyes then required the same strong lens usually needed in cases of aphakia. He, therefore, supposes that the part of the lens remaining transparent had undergone such a modification of its refractive power that its index was now equivalent to that of the aqueous humor. In cases of zonular cataract, when an artificial pupil is desired, Demotkine^{78 Apr.} proposes to make a *dilatatorectomy* (!), or excision of a peripheral part of the iris, leaving the sphincter intact.

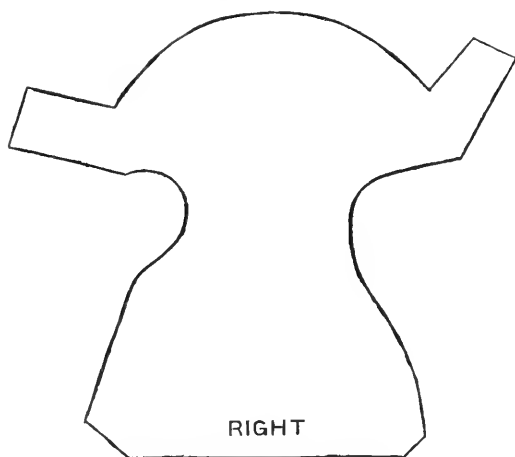
In congenital cataract Fieuzal^{171 Mar.} has abandoned the method of aspiration, according to Bowman, and now makes a dissection with a narrow lance-blade, entering the same perpendicular to the corneal radius at the junction of the superior and middle third. After thoroughly lacerating the capsule, and, if it have any, the

nucleus of the cataract, the section is enlarged in withdrawal, and through the opening the cataract is passed by pressure and lateral movements. If the knife-blade cannot cut up the lens masses, a Daviel spoon is introduced, and if they cannot be entirely evacuated by this method, they are left to the solvent action of the aqueous humor. The reason given for abandoning the aspiration method is that he had often met with cataracts with nuclei that were impossible to extract with the *aspirateur*. Coppez has had excellent success with the *aspirateur* in more than one hundred operations.

Alt³⁴⁷_{Dec.} has operated thirty-seven times in twenty-six patients for *infantile cataract*. Thirteen patients had zonular cataract in both eyes, ten had total cataract, and one had pyramidal cataract in both eyes. The operation was by discission, which is decidedly preferred. The results were very satisfactory, and tend to prove the theory of amblyopia exanopsia, for which reason the earlier after three months the operation is undertaken the better. In immature cataracts Higgins⁶_{May 12} recommends making a preliminary iridectomy below to avoid iritis, and when healed removing the lens in its capsule by a flexible wire vectis. Tweedy⁶_{May 19} contends that immature cataracts may be removed as easily and as successfully as ripe ones, and without much additional risk. In the last seven years he has successfully operated on twenty-nine such cataracts. One eye was lost from late serous iritis and glaucoma. Needling was required in thirteen cases. Such a success is a matter for great congratulation, since in many cases the long waiting for the ripening process is often of tragic importance to many. In all cases of *zonular cataract*, where there is a transparent portion of the lens periphery, or where, in juvenile cataract, the lens has shrunk so as to leave a transparent peripheral space, Schoeler⁴_{Oct. 1} advises an iridectomy or his precorneal iridotomy instead of extraction or discission. He has thus operated eighteen times with satisfaction. He considers the optical results better whenever zonular cataract is progressive, or when visual acuteness after dilatation is below $\frac{2}{5}$ in a normally developed child and eye. Little²_{Jan. 29} extracts the cataract two or three days after a preliminary discission by means of the apparatus of Teale. In this way he has had good results in forty-two cases.

Rheindorf,²⁵⁴_{Bd. 18, H. 2} the upholder of the method of puncturing the hyaloid membrane after the delivery of the cataract, bravely gives

the details of two hundred and seventy-three such operations, in which there were three cases of retinal detachment. Chisolm⁶¹_{Nov.3} answers the criticisms made upon the method of post-operative freedom from dark rooms, restraint, lying posture, and binocular bandages advocated by him. In seventy-four cases only one eye has been closed, and that by adhesive strips, and the patients have been allowed perfect freedom of movement and light. Not a single eye has been lost. Belt²⁴⁹_{Mar} presents a *résumé* of one hundred cataract operations, most of which were performed by Chisolm. Snell²_{Jan.28} has used the method of greater freedom in forty-eight cataract and over one hundred other operations with the greatest satisfaction. His pattern for cutting the plaster used is shown in the



(British Medical Journal.)

accompanying engraving. It gives the metal shield for cutting the plaster in the desired shape. By reversing it the same does for each eye, and is marked RIGHT and LEFT on the respective sides.

Murrel¹⁶² discusses the question of the after-treatment of cataract operations, etc., fully indorsing the liberal views of Chisolm, Michel, and others. Drake - Brock-

man⁷⁶_{Nov.} tried removal of dressings and exposure of the eye to light after the first twenty-four hours, but he found that this was followed by iritis and final loss of vision. He says that support of the divided cornea is needed to keep the wound from gaping. Collins¹²³_{Jan.} tabulates fifty cases of suppuration after cataract extraction. The figures seem to show a greater tendency to suppuration in the old than in the young, but no relation of the suppuration to the time of year was discoverable. In twenty-five of the cases there was nothing in the previous condition of the eye or patient to explain the complication. Explaining the occurrence in the cases of lachrymal, conjunctival, and lid diseases as due to infection, the question arises whether or not the thirty-eight

remaining cases were due to infection from the instruments or the operator. It is concluded that in some the corneal flap sloughed from want of sufficient nutrition and that the ensuing suppuration started without infection. The suppuration was checked in thirteen of the fifty cases, though in eight of these the globe was noted to be shrinking. The remaining five had normal tension but closed pupils. In the six cases of lachrymal complication, the sac and duct were syringed with an antiseptic lotion, with frequent dressing and bathing. The syringe used was shaped like a lachrymal probe, the size of a No. 5, with perforations on all sides but none at the end. A large quantity of the lotion was injected. In five cases the keratitis is ascribed to the use of the injection of biniodide of mercury solution into the anterior chamber. Four cases of glaucoma (following a large iridectomy and removal of the lens) are worthy of special mention. In a subsequent paper,⁴²³ July Collins, disobeying Graefé's injunction to firmly bind the suppurating eye, pursued the opposite plan of leaving the eye untied. He frequently bathed it with a tepid antiseptic solution. Free discharge was thus secured and the wound kept clean. Of six cases so treated, the suppurative process was checked in three. In nine other cases the galvano-cautery was applied freely along the line of infiltration without opening up the anterior chamber, after which the eye was treated as above stated. Three of these were successful; in three others suppurative process, although checked, was followed by shrinking of the globe; and in the last three panophthalmitis resulted.

Hotz³⁴⁷ Mar. lost two eyes from excessive hæmorrhage occurring seven hours after the extraction of the cataracts. Williams¹⁰⁹ Feb. ascribes the former frequent cases of post-operative hæmorrhage to the incision into the canal of Schlemm. He had, however, a case of recurring hæmorrhage when the cut was made in the corneo-scleral junction. Hileman²⁴⁹ Sept. had a case in which hæmorrhage continued for six days. He says it was from the choroidal vessels, which were weakened by sclerosis, after rheumatism or a recent choroiditis. Proudfoot³⁴⁷ Oct. had a case of severe hæmorrhage after cataract extraction that led to enucleation. The hæmorrhage proved to be from the retina.

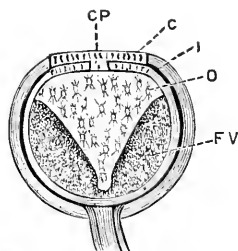
Gillet de Grandmont¹⁷³ Oct. charges the corneal obscuration that lasted for some days to the coagulating effects of Van Swieten's solution of mercury, used to irrigate the anterior chamber.

Caudron¹⁷³_{Oct.} reports a case in which iritis and posterior synechia are ascribed to the same cause, and Meyer has often noticed the same fact, though in one noteworthy case the corneal trouble remained as a permanent opacity. He, therefore, never uses even the weakest solution of mercury for irrigating purposes. Magnus,²⁰⁴_{Ed.34,H.2} gives the history of the operative procedure of washing out the anterior chamber in cataract extraction.

Fuchs⁸_{Oct.18,25} has in nine cases tried suturing the lips of the wound in cataract extraction in order to avoid the gaping of the same and hernia of the iris. Two sutures were used, their distances apart or from the beginnings of the section being not more than three millimetres. There was no iridectomy and the cut was peripheral: conditions favorable to hernia of the iris. The sutures were removed on the fourth day. The results were unfavorable in two out of the nine cases, but these are ascribed to the existence of erysipelatous infection. Galezowski¹⁷¹_{Mar.} thus sums up the results of his studies upon *luxated cataract*: 1. Luxated and subluxated cataracts should be operated upon as soon as possible in order to obviate consequent inflammations from arising. 2. The best method of extraction is by means of the simple flap section and without iridectomy. 3. The section should be upward, of small size, in the cornea, and two millimetres from the border. 4. The curette used for extracting the lens should be relatively of large size and well hollowed out, in order the better to seize a large cataract. Two cases of *dislocation of the lens*, one congenital and one traumatic, are described by Shaw,⁷⁶_{Sept.} Heddaens³⁵³_{May} reports a case of double dislocation, one upward, the other downward, with atrophy of the zonula. There was so-called monocular triplopia from a double image formed by the displaced lens, joined to a third image made by the media without the lens. Cases of dislocation of the lens are reported by Kollock,⁶¹_{Sept.1} Murphy,²_{Dec.24,'97} Page,²_{Feb.25} Hansell,⁵³_{Mar.31} Ryerson,³⁹¹_{Mar.} Coroenne,⁴¹⁴_{Oct.57} Fano,²⁵³_{Mar.} Schloesser,³⁴_{Jan.19} The accompanying plate beautifully illustrates the entoptic appearance seen by Exner as indicative of normal irregular astigmatism.

DISEASES OF THE VITREOUS.—Benson⁷⁶_{Oct.} proposes the name *hyalitis punctata* to designate a condition of the hyaloid membrane similar in appearance to that of the iris in serous iritis. In the report a description of a case is subjoined. There was coincident keratitis punctata. Munson's case²¹⁶_{Apr.} of *ossification of the vitreous*

is believed to be unique as to its size. It was one inch in circumference, and one-half inch from base to apex of cone. We append a cut showing the relative size, position, etc., of the formation. The ossification took place within five or six years, in an eye shrunk at least one-third in size, and produced sympathetic trouble only late in the history. Its origin is thus accounted for: During inflammation, years previous, there had been a detached retina which took the shape of a funnel, with its apex attached at the optic nerve entrance and its base at the ciliary body. This funnel became filled with connective tissue due to chronic irido-cyclitis. The connective tissue in time ossifying, we have the resulting bone in the shape of the cone. Bull³⁴⁷_{July} has performed incision with a needle or slender knife in seventeen cases (fifteen patients) of *membranous opacities* of the vitreous. Cocaine was employed, the insertion being made just in front of the equator and below the insertion of the external rectus. There seems to be no danger from hæmorrhage or loss of vitreous. Fourteen of the seventeen cases showed decided improvement. The eye must be free from all inflammatory symptoms before the operation. Devincenzi³⁰_{v.17, No.1} had a case of *cysticercus* beneath the retina and another subconjunctival. The latter was extracted. Despagnet¹⁷³_{Sept.} also had a case of doubtful diagnosis. In a case seen by Boisvert¹⁸⁸_{Apr.22} there were intense pains and inflammatory symptoms with irido-cyclitis. A neurotomy of the nasal branch gave relief. Thinking that the considerable pain so universally complained of in evisceration is due to inflammatory irritation and pressure on the ciliary nerves lying in groups on the inner surface of the sclera, Prince³⁴⁷_{July} makes application of pure carbolic acid to the entire inner scleral wall after removal of the cornea and bulbar contents. He says the effect of this is also good by closing the vascular openings through the sclera, and thus fortifying this barrier against the escape of microbes into the orbit or sheath of the nerve. In twenty cases the results were most happy. Mules⁴⁶² urges those who have not adopted the artificial vitreous after evisceration to make a trial of it, and thinks that those who have done so will



MUNSON: OSSEOUS FORMATION
WITHIN THE EYE.

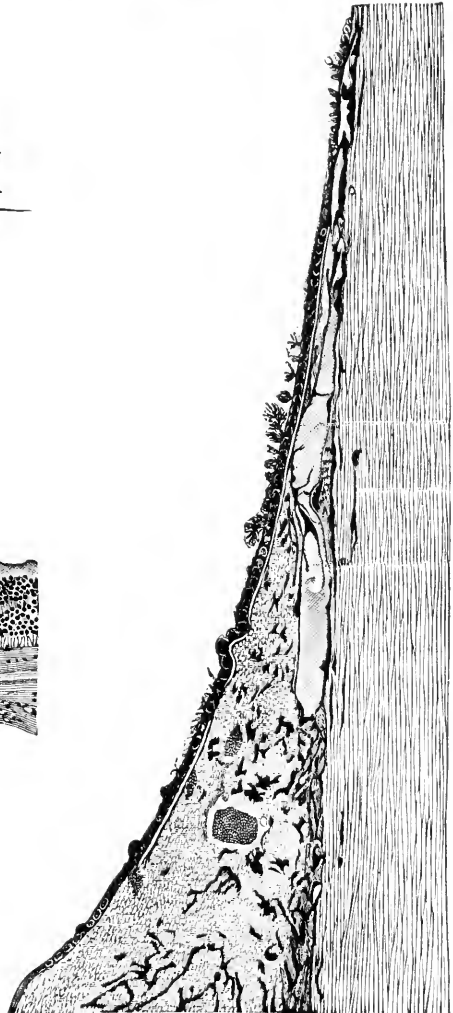
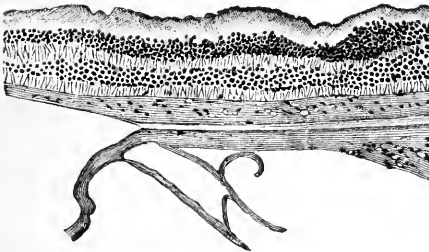
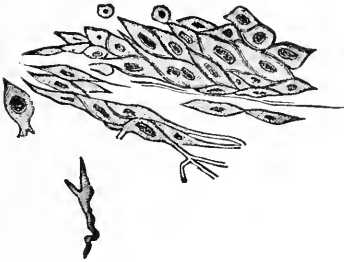
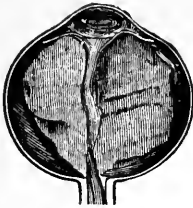
CP, contracted pupil; C, cornea; I, iris; O, ossification; FV, fluid vitreous.
(*Albany Medical Annals.*)

not return to enucleation or neurectomy. A well-fitting artificial eye is also necessary to a successful result.

DISEASES OF THE CHOROID.—Cases of *ossified choroid* are reported by Faravelli and Gazzaniga,³⁰ V.17, No.1 Goode,⁵³ May 26 Reid,²¹³ Mar. and Meighan,²¹³ Aug. Schiess-Gemuseus,²⁰⁴ Bd.34, H.3 had an instance of the very rare *cavernous angioma* of the choroid. Grossmann⁷⁶ Aug. enucleated an eye with *cavernous sarcoma* of the choroid, in which there were considerable difficulties in diagnosis. Webster and Gieson²⁴⁹ Mar. enucleated a globe in a case of sarcoma of the choroid with metastatic infiltration of the optic nerve. There was prompt recovery without recurrence. Other cases are recorded by Fieuzal,⁴¹⁴ Jan., Apr. Poncet,¹⁷³ Oct. and Griffith.² Mar. 3, 17 The annexed illustrations of the case of melanotic *sarcoma* of the choroid seen by Scimemi,³⁰ V.17, No.2 show the location of the growth and the consequent retinal detachment. It sprang from the connective tissue of the internal strata of the choroid.

To the five reported cases of *metastatic carcinoma* of the choroid, Schapring¹⁵⁰ Sept. adds a sixth (the first reported American). Abstracts of the other cases are given. The ocular symptoms began to manifest themselves about two years (August, 1887) after the excision of a scirrhus carcinoma of the breast and axilla. The patient died in December, 1887. A description of the autopsy is given. Litten⁴ Dec. 3 communicates the details of a case of *metastatic melano-sarcoma* of the liver that had been four years in progress. The eye had been removed for sarcoma of the choroid in 1885. The patient died in 1888. The liver and spleen were enormously enlarged, grown as if into one mass, and thoroughly interpenetrated by the tumor. There was melanuria. As melanotic sarcoma of the liver never develops except by metastasis and frequently following its choroidal appearance, the earliest possible enucleation of an attacked eye is highly advisable. Oliver¹⁰⁷⁰ 1887 had a case of *double chorio-retinitis*, with partial degeneration of the optic nerve, associated with curious lymph extravasation into the retina and vitreous. In one eye this extravasation had broken loose, and was floating in the vitreous. The media were clear. The choroid looked as if "black-peppered" over its entire surface.

DISEASES OF THE RETINA.—Nettleship⁷⁶ Feb. details a number of cases to show that overuse of the retina may produce organic disease of the fundus. In addition to overuse, it is noticeable that exposure to the glare of heat, snow, etc., was also frequently



MELANOTIC SARCOMA OF THE CHOROID.
(*Annali di Ottalmologia.*)

present. Stewart³⁴⁷_{July} had a patient who was a workman at a turning lathe, and thus looking fixedly for ten hours a day at an object revolving some fifty revolutions a minute. No cause but *anaesthesia of the retina* could be found for his inability to distinguish small objects and his frequent need of ocular rest. Change of work brought entire relief.

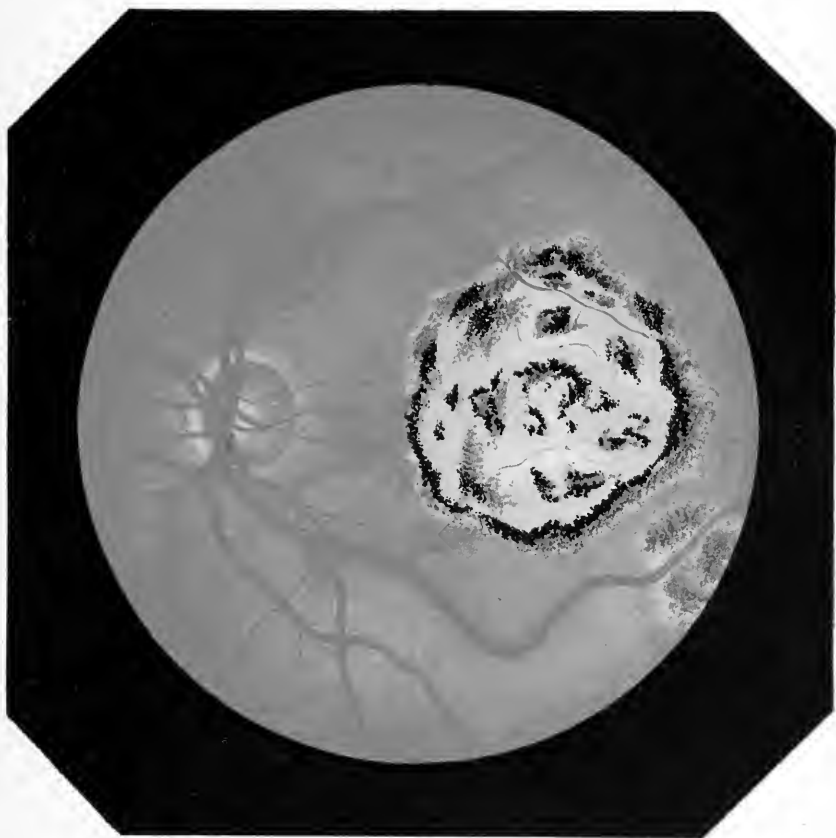
Silex²⁵⁴_{Bd. 18, II. 3} gives a very interesting case of supposed coloboma of the macula lutea in the left eye of a sixteen-year-old girl born of healthy parents.

Ostwalt⁴_{Nov. 5} emphasizes the earliness of the retinal symptoms



PIGMENTARY RETINITIS WITHOUT PIGMENT.
(*Centralbl. f. p. Augenheilkunde.*)

of secondary syphilis in connection with arterial disease of the cerebrum. The ocular symptoms precede the cerebral often by years. Hence the lesson of devoting rigid care to the slightest symptoms of visual deterioration in syphilitic subjects. His observation shows him that from within a few months to a year after infection a central retinitis with or without intercurrent iritis may appear, characterized by small, grayish-white, grape-like infiltration spots at the ends of the arterial branches. These may also occur at the periphery. These

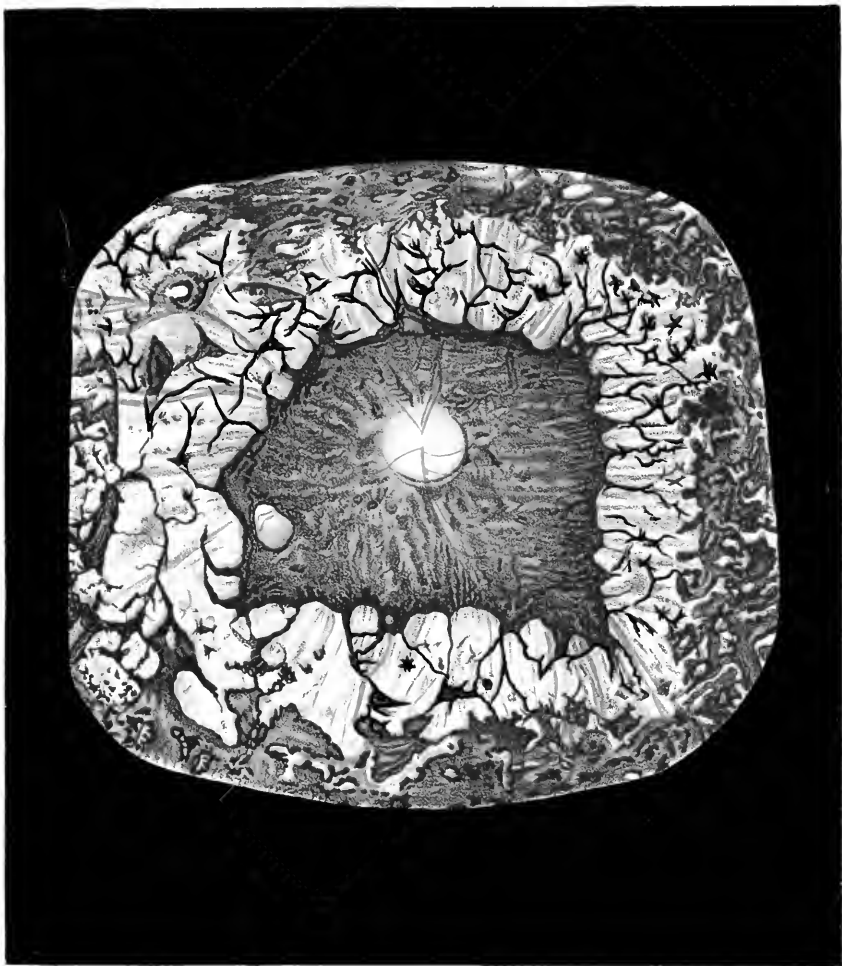


Burk A M F - trübe Leth F hals

Coloboma of the Macula lutea (Silex)

Archiv für Augenheilkunde.





From K&M Festschrift 10th Plate

Retinitis pigmentosa atypica (Jacobson)

Right eye Inverted Image

Ed. H. M. C. 1911, p. 111, fig. 111

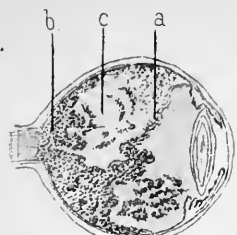


Fig. 1^a

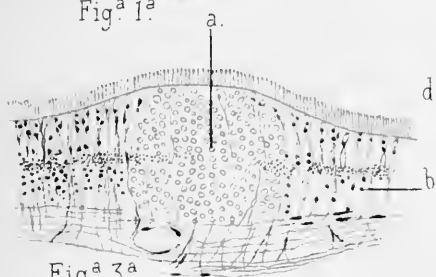


Fig. 3^a

Fig. 2^a

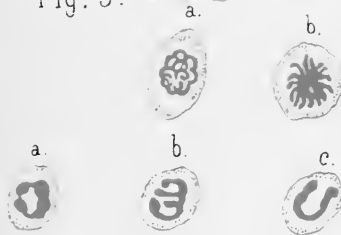
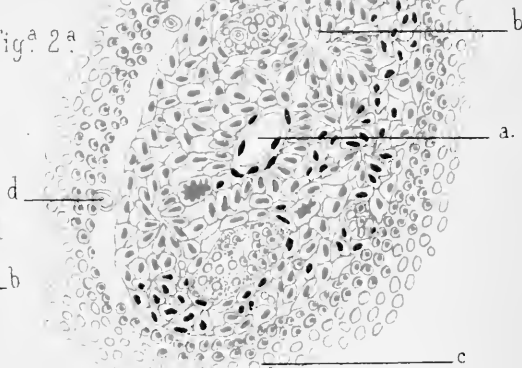


Fig. 5^a

Fig. 4^a

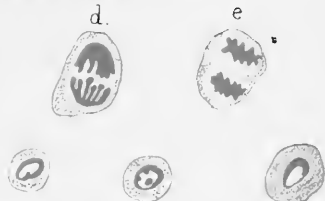
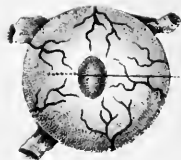
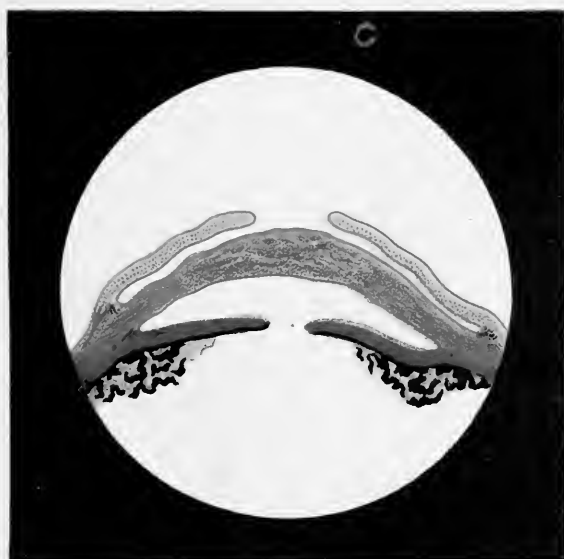


Fig. 6^a

Glio-Sarcoma of the Retina (Mazza)



Duke, C. McPitridge, Lith. Phila.

Peculiar Alteration of the Bulbar conjunctiva (Faravilla)

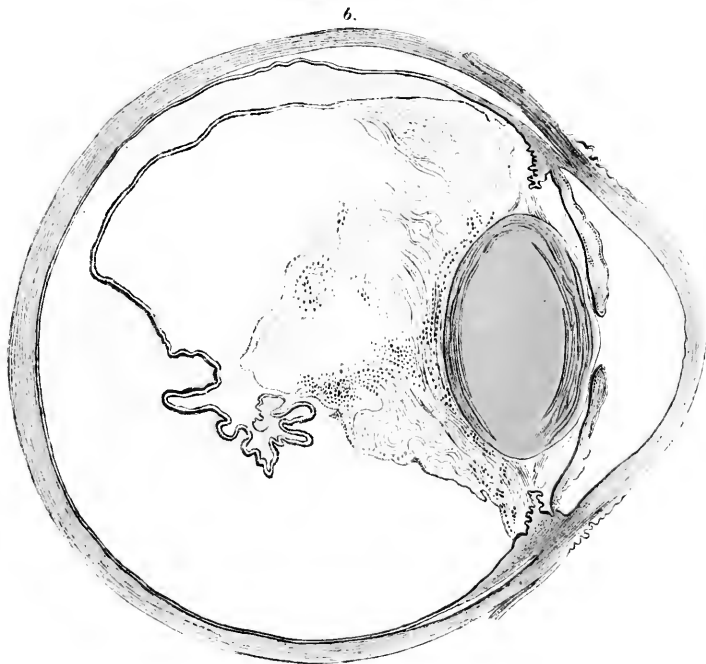
Annali di Oculologia

are so delicate in color and appearance as to be overlooked with ease. The subjective evidence of this lesion is a small negative central scotoma and other visual disturbances. Peltesohn's case¹⁹⁰ July is noteworthy as presenting all the characteristic symptoms of *retinitis pigmentosa* without the pigmentation. A reproduction of the illustration is given herewith. Bull¹⁶² explains a class of cases hitherto supposed to be due to *emboli of the retinal arteries* as in fact dependent upon *spasm*. The symptoms—passing obscurations in the visual field, rapid re-establishment of the circulation, changes of vessel lumen, local constrictions, etc.—are explained in this way without calling in the supposition of general vascular or cardiac disease; this latter, in fact, not being demonstrable, and unsuspected in any other manner. The action of the constant current in relieving the above symptoms is also explainable on the supposition of *spasm*. Where mechanical obstruction does exist, it is probably a thrombosis, and not an embolus. Further, it is probable that thrombi may be the result of spasmodic constrictions of the arteries. An atypical case is described by Jacobson,³⁵³ May and we present our readers with a colored plate illustrative of the appearance. The influence of heredity was clear, though parental relationship was not found. The subjective symptoms were typical. The ring of atrophic choroid is remarkable. The author views his case as an intermediate example between a typical case and a case of choroideremia published by Mauthner.¹¹²⁷ v.2, No.2,3 Should the atrophic zone in Jacobson's case progress to the papilla, it would present an appearance like that in Mauthner's. Standish⁹⁹ Apr.19 treated a case of pronounced *retinitis pigmentosa* with the continuous electric current for five minutes at intervals of five days for fifteen months. Vision increased from twelve-fortieths and twelve-fiftieths to twelve-thirtieths and twelve-fifteenths, whilst the field increased from about twenty degrees to about seventy degrees. Mellinger³⁵³ Aug., Sept. treated three cases by diaphoretics with good results. One of his cases is noteworthy for the size of the retinal hæmorrhage and its complete absorption, with perfect reinstatement of vision. Anæmia and overexertion seemed to be the only cause. The principal therapeutic measure was rest, recumbency, and long-continued application of ice to the eye. A colored plate showing the size and position of the hæmorrhage is given herewith. Lang² Mar.17 had a case of large macular hæmorrhage, which wholly absorbed and left perfect vision.

Oliver³⁴⁷_{July} reported a case of *embolism of the central artery of the retina*, without other symptoms of disease, systemic or local. There was a marked œdema of the retinal fibres extending two or three diameters in all directions beyond the papilla, and especially dense in the macula region. There was a cherry-red spot at the macula and scattered hæmorrhages. Beaded blood-currents formed, appearing first in the veins. The œdema heightened and the vessels increased in calibre, followed by continuous degeneration changes in the substance of the nerve and retina. Cases of *glioma* of the retina are reported by Hosch,²⁵⁴_{B.18,II.3} Capron,²⁵⁴_{B.18,II.3} Vittorio,³⁰_{V.17,No.4} and Mazza.³⁰_{V.17,No.2} We append colored figures of the last case. Gorecki¹⁷³_{Sept.} had a case in which as a result of an injury there was a fibrinous exudate largely filling the vitreous chamber and simulating *glioma*. The most important contribution of the year concerning *retinal detachment* is Nordensen's noble work,¹¹²⁸₁₈₈₇ in which Leber's theory is sustained. The cause is found to be a shrinking of the vitreous with traction. The study is based chiefly upon three specimens of spontaneous detachment, four of the views illustrative of the condition being given in the annexed plates. The following are the conclusions:—

The detachment appears more frequently with sudden than with slowly developing visual disturbances. Rupture of the detached retina occurs in either class. Detachment and rupture take place suddenly without tension changes in a functional eye, the opposite eye being blind for years. In several cases the rupture of the detached retina takes place in that part of the fundus corresponding to the region in which the disturbance of vision first appeared. Myopia is the most frequent refraction error, though others may co-exist. More men than women are affected. As regards age, the frequency increases gradually up to the sixtieth year. In rare cases, spontaneous detachment occurs in chronic glaucoma with transparent media, and without symptoms of acute inflammation. Occasionally, in addition to detachment and rupture, a deepening of the anterior chamber occurs. Detachment may occur in eyes with hæmorrhages into the vitreous and retina, and with resultant connective tissue changes.

DeWecker,¹⁷¹_{Mar.} accepting the theory of Leber, says we must first aim at detaching the retina from the detached vitreous body in order to expect any real curative result. Boucheron and Abadie¹⁷¹_{Mar.} do not



Spontaneous Retinal Detachment (Nordenstam)

a. Vertical section showing shrinking and detachment of the vitreous, the foldings of the retina, which is detached, to the ciliary body. The fibrous structure of the vitreous is shown in b. enlarged 69/

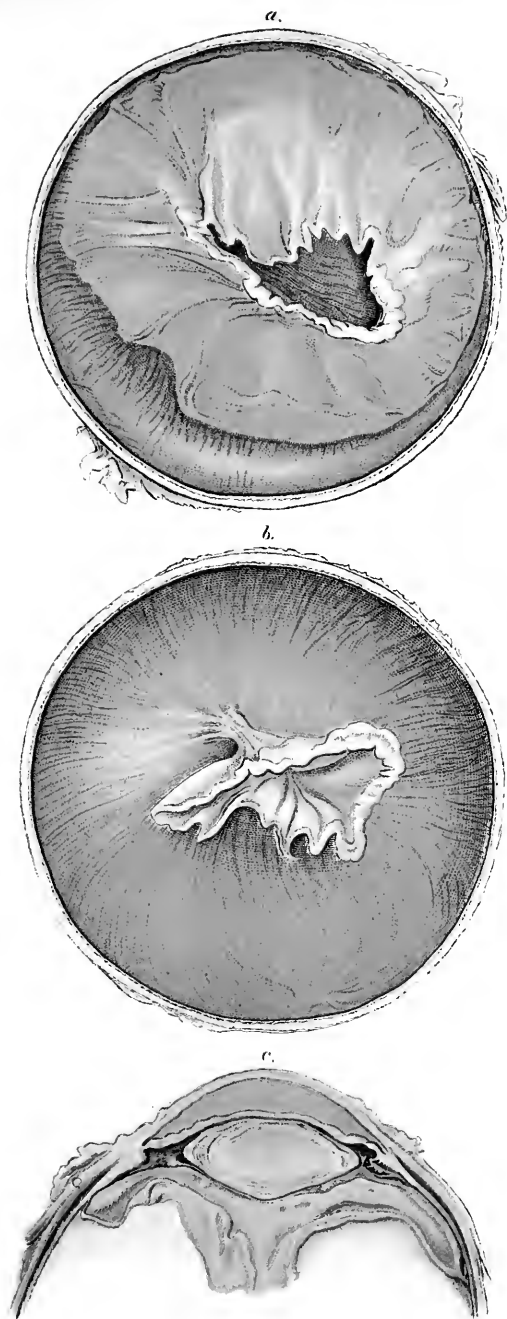
From Nordenstam's "Die Netzhautablösung"



Spontaneous Retinal Detachment 1.

Vertical section of the anterior part of the globe enlarged 19/1. The structure of the vitreous and zonula is shown in an enlargement of 52/1.

From Nerdenson's *Die Netzhautablosung*.

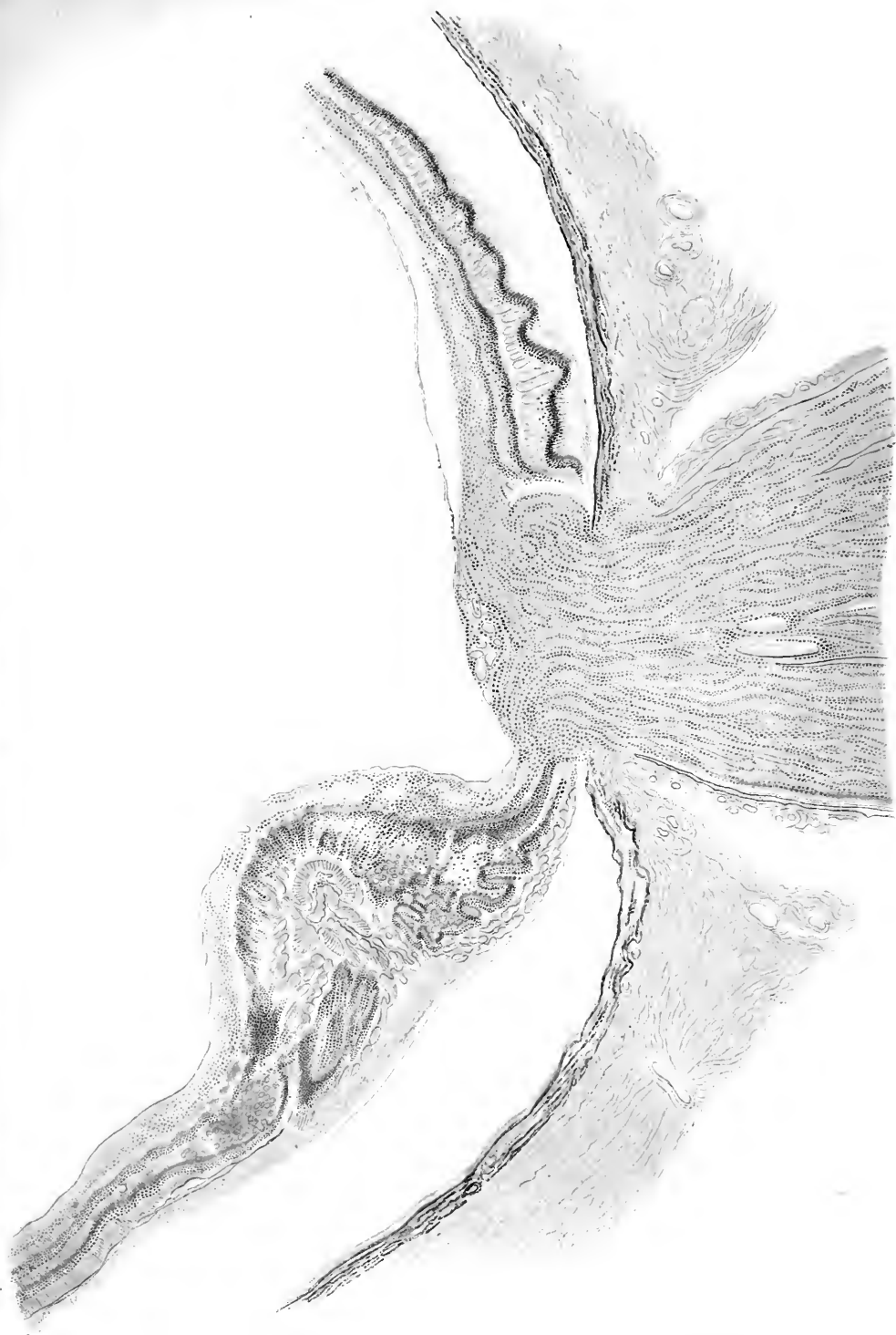


Spontaneous Retinal Detachment (Nordenson)

a. Anterior half of the globe seen from behind. b. Posterior half of same
c. Meridional section of anterior part of the globe

From Nordenson's "Die Netzhautablösung"





Retinal Detachment in Retinitis Albuminurica

Section through the Papilla. The thickening and elevation of the retina is shown below with fibrous exudate upon the external side and deposits of colloid masses throughout.

From Nordenskiöld's "Die Netzhautablösung".



accept the theory of vitreous detachment, the former emphasizing the action of the ciliary body in exuding fibrogenous material, and the latter pointing to the phenomena accompanying myopia in detachment. To effect the combined result of reduced pressure and local adhesion, Abadie performs sclerotomy, and produces local irritation (injection of a drop of Condyl's fluid) at the site of puncture. Galezowski¹⁷³_{Mar.} concludes that detachment is not an incurable disease; that the detached portion may again become functional; that aspiration without suture may lead to amelioration; and that with suture it is but very rarely successful. A number of cases improved by aspiration are detailed.

Our corresponding editor, Dr. Landolt, agrees with Puech's contention¹¹²⁹₈₇ that iridectomy has no effectiveness as a therapeutic measure in detachment of the retina. Bettremmieux²⁷⁴_{Jan.} performs iridectomy to prevent detachment. Guaita³⁰_{V.17, No.3} has treated five cases of retinal attachment with eserine instillations, and reports increase of the field of vision and amelioration of the symptoms in all. The duration of the treatment varied from three to twenty days. Upon ceasing the instillations, there was immediate resumption of the symptoms. Sutphen³⁴⁷_{July} reports a case in which he had great success in relieving detachment by puncture of the retina from beneath the detachment. A recurrence took place in both eyes and a second operation was successful in giving permanent attachment to the retina of one eye. There was freedom from all reaction after the operations.

DISEASES OF THE OPTIC NERVE.

Badal⁷⁰_{Aug.19} finds that affections of the optic nerve are about as frequent symptoms (22 per cent.) of ocular syphilis as those of the choroid and muscles. Of one hundred and thirty-nine cases, eighty-two were of confirmed atrophy, thirty-eight of neuritis, sixteen of neuro-retinitis, and three of "choked disk." Jocqs¹¹³¹₁₈₈₇ has been able to gather sixty-two cases of *tumors of the optic nerve*, and presents us with an analysis of the same. Sarcoma, myxoma, and myxo-sarcoma are the most frequent. The globe is not invaded, and if destroyed, it is by compression. The etiology is obscure. The young are the most frequent subjects. Neither heredity nor traumatism play any rôle. The diagnosis is made up from the exophthalmia, the visual troubles, and ophthalmoscopic

signs. The prognosis is grave from the tendency to invade the intracranial cavity. Although encapsuled, thorough extirpation is necessary to avoid possible return. Complete ablation is the only proper treatment. The globe can rarely be saved, and if saved generally atrophies afterward. An exploratory incision was first made through the upper lid parallel with the roof of the orbit, through which the finger was thrust and felt the tumor surrounding the optic nerve. The globe and tumor (a sarcoma) were then excised *en masse*. The case of Schiess-Gemuseus²⁰⁴_{Bl.34,II.3} of extirpation of a *myxo-sarcoma of the optic nerve* is of interest as being the almost unique case of preservation of the globe of the eye with but slight resultant injury of motility except some ptosis. Carter⁷⁶_{Oct.} has opened the sheath of the optic nerve three times for the relief of pressure. The first case was unsuccessful, the other two seemed partially so. Bickerton⁷⁶_{Oct.} did the same operation twice, and one case seemed to show improvement of vision.

Manz¹⁷¹_{June} contends that the theory of Leber and Deutschmann as to the symptomatic value of *optic neuritis* (see ANNUAL, 1888) is incorrect, because (1) the variations of intensity shown by the papilla alterations do not comport with the hypothesis; (2) the affection, which from the theory should frequently be expected, is but rarely observed in meningitis; (3) likewise in suppurative encephalitis it is seldom observed, and when it appears the exudation into the sheath is serous, and not purulent; (4) finally, optic neuritis is infrequent in apoplectic attacks, which are often followed by inflammation in the neighborhood of the apoplectic centres.

Derby³¹⁷_{Oct.} had a case of *monocular optic neuritis* in which the swelling of the papilla at one time reached 7 D. and light perception was lost. Under large doses of iodide of potassium and mercurial inunctions the swelling was greatly reduced and vision improved to seven-tenths. De Schweinitz¹¹⁹_{Nov.} reports what seems to be a genuine case of acute unilateral optic neuritis brought on or aggravated by exposure. According to Maklakoff, corresponding editor, of Moscow, Russia, Dr. Roumchevitch reports four cases of *pseudo-optic atrophy*—all with pronounced ophthalmoscopic symptoms and unimpaired vision. Three of these cases had had syphilis and optic neuritis. Specific treatment ameliorated the symptoms.

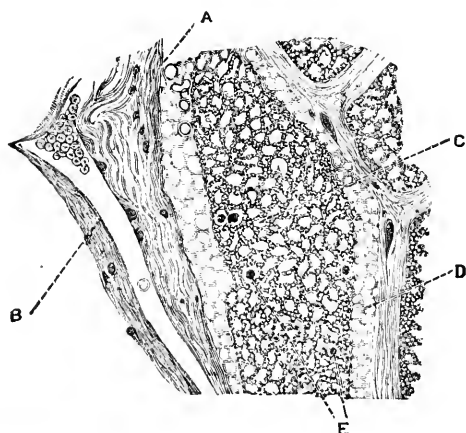
Haswell²_{Dec.3} records a peculiar instance of *inherited amblyopia*.

Four children of same parents became blind at forty-eight, nine, twenty-one, and fourteen years respectively. In the third generation, of one parentage six children became blind at from eighteen to thirty years of age. In the next generation, there were two cases among many children. The disks were atrophied, and the retinal vessels were small. The blindness came on within a year after failure of sight began, and without pain or other symptom. Thomson's case ³⁴_{Mar.'27} of *hereditary optic atrophy* is noteworthy from the fact that five brothers and two uncles suffered from the same malady, and because the condition remained stationary for some seventeen years with bluish-white discoloration of the papilla, central scotoma, fair peripheral vision, and red-green blindness. Pupillary immobility appeared and cerebral symptoms (melancholia, etc.) ensued. Jacobson ¹⁹⁰_{Dec.'27} explains the strange case of *congenital atrophy of the optic nerve* where there is a healthy mother, normal sized papilla, absence of cerebral symptoms, etc., only as due to an intra-uterine pathological process that has destroyed the already completed optic nerve. Galeczowski ³⁶³_{No.17} divides *papillary atrophy* into two classes—in the first, the attack is upon the axis cylinders, and is characterized by clear-cut contours of the papilla, the conservation of the large vessels, and disappearance of the capillaries; and the second is consecutive to vascular lesions. The study is based upon ten hundred and twenty-nine cases (eight hundred and seventy males, one hundred and fifty-nine females). Of this number, seven hundred and seventeen were ataxics, in four hundred and ninety-six of which there were syphilitic antecedents. He says though ataxic atrophy is not curable, its progress may be arrested when it is unaccompanied by particular changes of the vessels.

Ulrich ²⁵⁴_{Mar.} presents the results of the examination of three cases of *atrophy of the optic nerve* following optic neuritis from cerebral tumor. (See cuts, page 108.) He concludes that in such cases we do not have a true ascending neuritis but a general degenerative process of the whole nerve. As this process reaches its maximum at the papilla it has been erroneously called an ascending neuritis. The atrophic fibres are found especially in the peripheral portions of the nerve, because of the pressure exerted by the œdema existing in the sheath and adjacent spaces. It is this œdema that is the sole cause of the degeneration, and it explains the

peculiarities of visual defects in papillitis. The author even thinks that the œdema may take place in parts of the nerve distant from the papilla and no papillitis result, though producing at last a degenerative process, and thus accounting for the peculiar discoloration of the papilla seen in some cerebral tumors where there is no decided papillitis.

McKeown,²_{Jan. 28} reports a case of optic atrophy greatly improved



A, œdema, with myelin; B, vena centr.; C, œdema; D, nerve-fibre; E, myelin.



PAPILLITIS AND CONSECUTIVE OPTIC ATROPHY.
(*Archiv f. Augenheilkunde.*)

by treatment with pilocarpine. Charles Bell Taylor,²_{July 21} recommends resection of the optic nerve in certain cases in preference to ablation of the eyeball. He says: "The proper cases are those in which the eyeball, though sightless, has a good appearance, and is only affected with neuralgia or recurrent inflammation, or in which enucleation is not permitted. In thirty-one cases the author has obtained the most gratifying results. Motion in all directions is

perfect, and it is sometimes difficult to tell which eye has been done."

GLAUCOMA.—Priestly Smith's propositions concerning glaucoma, which he read and elaborated before the International Congress of Ophthalmology held at Heidelberg in August, are summarized as follows³¹⁷_{Sept.} :—

1. *Definition of Glaucoma*.—An excess of pressure within the eye, plus the causes and the consequences of that excess.

2. The pressure of the intraocular fluids is determined by three conditions: (*a*) the condition of the secreting organs; (*b*) the condition of the outlets; (*c*) the character of the fluids themselves.

The aqueous and vitreous fluids are secreted by the ciliary portion of the uveal tract. The aqueous escapes at the angle of the anterior chamber (filtration angle). The vitreous fluid escapes at the papilla, very slowly as compared with the aqueous. Any surplus fluid in the vitreous in the healthy eye can pass easily into the aqueous chamber.

3. The chief factors which can raise the intraocular pressure are: (*a*) hypersecretion by the ciliary processes; (*b*) obstruction of the filtration angle; (*c*) serosity of the fluids.

Hypersecretion is sometimes the exciting cause of the attack, but the glaucoma process cannot be explained by the hypothesis of a persistent hypersecretion.

Obstruction at the filtration angle is present in most cases of glaucoma; the angle is compressed or closed. Experiment proves that, when the iris base is pushed forward, filtration is greatly retarded. Serosity of the fluids is present in many forms of glaucoma. It is a very important factor in the secondary glaucoma of serous iritis and kerato-iritis; in these cases the filtration angle is widely open and the chamber deep.

4. In most forms of glaucoma the filtration angle is closed. What are the antecedent changes? When they are invisible, we call the glaucoma "primary;" when they are visible, we call it "secondary." In every form of secondary glaucoma, except those in which the aqueous chamber is distended by serous fluid, the iris base is found on dissection pushed forward against the cornea.

5. In primary glaucoma of recent date, dissection shows the

iris base pushed forward by the swollen ciliary processes, and in many cases the processes are themselves pushed forward by the lens and zonula.

6. The chief predisposing cause is an insufficient circumlental space. Thus, the liability to glaucoma increases with age, because the lens grows larger as life advances. Again, the liability is greater in the hyperopic eye, because the ciliary muscle and processes are more prominent in the direction of the lens. Again, a small cornea appears to predispose to primary glaucoma. Senile changes in the vitreous which obstruct filtration into the aqueous chamber are perhaps among the predisposing causes. Perhaps, also, in minor degree, senile rigidity of the sclera and senile degeneration of the blood-vessels.

7. The chief exciting causes are those conditions which overfill the uveal tract with blood. General disturbances which depress the circulation and overfill the venous system are the usual antecedents. The ciliary processes swell and, by reason of the insufficient circumlental space, push forward the iris base and compress the filtration angle.

Atropine, under predisposing conditions, excites glaucoma by thickening the iris base.

8. Glaucoma aggravates itself, because increasing pressure on the choroidal veins causes increasing congestion of the ciliary processes and increasing congestion of the filtration angle.

9. The anatomical predisposition and the vascular disturbance are complementary to each other in varying proportions. Acute glaucoma presents the maximum, and chronic, non-congestive glaucoma the minimum of vascular disturbance.

Snellen's ³⁴⁷_{Sept.} conclusions are as follow:—

1. From a clinical point of view, glaucoma posterius (relative overfullness of vitreous chamber) must be strictly distinguished from glaucoma antierius (relative overfullness of anterior chamber: iritis serosa, keratitis diffusa).

2. In glaucoma posterius, myotics tend to reopen Fontana's spaces by stretching the iris and contracting the meridional fibres of the ciliary muscle. They excite the circulation. In glaucoma antierius, myotics are prejudicial by extending the surface of the iris and by provoking pupillary adhesions. Mydriatics act in the opposite way.

3. Sclerotomy is indicated in all cases of increased tension (hypertonus): it benefits by evacuating serous fluids, loosening peripheral or pupillary iris adhesions, and readmitting the impeded circulation.

4. The direct thrust of the iridectomy knife involves less danger of prolapse of the iris than the cut from within outward of the cataract knife.

5. Myotics are a *sine qua non* in performing sclerotomy. The myotic contraction of the iris prevents prolapse; the contraction of the uveal tract *in toto* promotes the outflow of the fluids and diminishes the pressure of the choroid against the sclera.

6. Excision of the iris is a subordinate part of the glaucoma operation; but it is indicated when the iris tends to prolapse, and when the aqueous humor is retained behind the iris. The divided sphincter of the iris stretches the iris periphery less effectually than the undivided sphincter. Sclerotomy without iridectomy permits repetition of operative treatment.

7. Impending hypertonus should interdict all straining of the accommodation.

Schoen's theory is a valuable attempt to find the primary cause of hypertonus in a function of the eye.

8. When the elasticity of the lens is lost, contraction of the circular fibres of the ciliary muscle will relax the suspensory ligament, and this relaxation will tend to a forward movement of the lens and ciliary processes.

9. In glaucoma perfectum, extirpation is indicated by impending pain, and because of its occasional association of the disease with intraocular tumor.

Jacobson,²⁰⁴_{B.L.H.I.} accepts as beyond any question the results of Birnbacher and Czermak as regards the pathogenesis of glaucoma, that it arises from a venous stasis in the anterior segment of the choroid, with a secondary phlebitis and stenosis of the large veins, and especially of the vasa vorticosa. With the changes of the pupil and accommodation there are constant changes in the blood pressure of the ciliary processes and veins to the ora serrata, and hence the variations of filtration into the vitreous. The canal of Cloquet with its outlet in the central canal of the papilla is the safety-valve for the protection of the optic nerve against an overloaded vitreous with its choroidal filtrate. In congenital glaucoma

and in progressive myopia, the normal vitreous is replaced by an excessive abnormal product that produces the excavation of the lamina cribosa, and stretches the sclera in all directions. Hence, increase of tension is not the cause of glaucoma, but is due to the increase of the vitreous from choroidal venous stasis. As to the origin of the excavation, clinical experience shows that glaucoma with increase of tension may exist without marginal excavation, and that marginal excavation may exist without increased tension. The characteristic of the prodromal, the subacute, and the acute stages of glaucoma is always increase of tension. Excavation does not yet exist, because either sufficient time has not elapsed or a sufficiently high pressure produce to the excavation, which is always present in the chronic inflammatory condition. A long-continued hypersecretion may produce papillary changes without being recognizable by the touch. The relation of the papillary excavation to troubles of the anterior choroid is considered indubitable. The increased filtration is always present. In the acute, chronic, and malignant types there is always increase of vitreous, and anomalies of the vitreous are signs of disease of the choroid. hydrophthalmic products of dilatation and stasis in the anterior veins of the choroid. As to therapeutics, we have the choice between iridectomy, sclerotomy, eserine, and pilocarpin. Against acute and chronic inflammatory glaucoma, iridectomy is the sovereign remedy, and in glaucoma simplex with increase of tension it is useful. Iridectomy is injurious in glaucoma simplex with limitation of the field close to the fixation point; also in malignant glaucoma without aqueous after iridectomy. Sclerotomy is of only temporary advantage, but exceptionally to be employed when the anterior chamber is very weak, or when the malignant type is feared. Eserine is good in acute attacks because it hastens the blood-currents, but does not protect from relapses, and does not do away with iridectomy.

Theobald³⁴⁷_{Oct.} makes the suggestive assertion that astigmatism acts as a factor in glaucoma by producing the hyperemia of the ciliary body, etc., admitted to exist in glaucoma. Twelve cases are detailed, in which either astigmatism was found to be present in glaucoma, or in which certain cases of astigmatism were associated with signs of a threatened glaucoma.

Schlegkendal³⁵³_{Feb.} contends that the explanation given by Stoelt-

ing,²⁰⁴_{BL.34,p.177} that in a case described by him the increased tension was due to suprachoroidal œdema or lymph stasis between the sclera and choroid, is unfounded, and that the appearances were the results of changes taking place after the excision. The closing of the angle of the anterior chamber is, at all events, not the primary cause of the glaucomatous process, though the direct cause of the increased tension. The case of Stoelting²⁰⁴_{BL.34,II.2} goes to show that the glaucomatous process was caused by an increase of the vitreous by transudation. Wieherkiewicz⁷⁸_{July} had a case of glaucoma in a man sixty-six years of age, apparently suddenly developed by a single drop of atropine solution. The tension was extreme, the vision *nil*, and the eye very painful. Eserine with hypodermic injection of morphine brought complete relief in three days. The author thinks there was chronic glaucoma, with symptoms manifested only occasionally, which were suddenly precipitated by the atropine.

Logetschnikoff⁷²⁵_{July} (as reported by our corresponding editor, Dr. Maklakoff) describes three cases of glaucoma arising in *aphakial eyes*.

Terson¹⁶⁰_{No.6} describes a case of ectasia of the cornea without glaucomatous symptoms which was relieved by operation.

Through our corresponding editor, Dr. Chiralt, we learn of an interesting case of acute glaucoma coming on with symptoms of gastric catarrh; *i.e.*, with intense cephalalgia, vomiting, fever, etc. An iridectomy gave relief both to the local and systemic symptoms. Ferber¹¹³⁰₁₈₈₇ reports a case of glaucoma resulting from contusion of the globe without lenticular disturbance, etc. The author ascribes the phenomenon to a neuropathic agency. From the report of our corresponding editor, Dr. Rijnberk, of Amsterdam, we learn that Straub⁷³⁰_{Sept.1;}²⁰⁴_{BL.34,II.3} would add to the complexus of *anatomico-pathological* characteristics the following: The retraction of the choroid in normal bulbs is in glaucomatous eyes either absent or diminished in extent. As the normal choroid bears part of the intraocular pressure, its inelasticity would thus operate to cause passive congestion of the venæ vorticosæ, with which the increased ocular pressure stands in close connection. Contraction of the ciliary muscle tends to give greater tension to the choroid, and thus restore the equilibrium, and perhaps explains the action of myotics in the glaucomatous process.

In Nettleship's most instructive lectures⁴²³_{July} on the "Prognosis

in Chronic Glaucoma" he calls attention, *inter alia*, to the obstacle to the formation of a trustworthy decision in the long duration of some cases even if untreated, one instance of twenty-two years, and one of nine, etc. Of sixty-six cases of chronic, uncomplicated glaucoma, the second eye was free from disease in thirty-one. Of these last, in twenty-six cases at least a year elapsed since the disease in the first eye, and in no less than thirteen of these twenty-six five or more years had elapsed without the second eye being attacked. In thirty-five of the sixty-six both eyes were attacked, and probably a greater number. Hence, in about two-thirds of the cases the disease is sooner or later symmetrical. If the second eye escapes for one year, there is about one chance in three that it will escape for five years or more. The more chronic the disease in the first eye, the longer the second eye is likely to escape. Eserine may check and keep the disease at bay for a time. Senile cachexiæ are distinctly unfavorable to operation in chronic glaucoma, and their absence and the existence of an active pupil are favorable. The earlier the operation in the chronic progressive type, the better. After an extensive trial of sclerotomy (some fifty cases) the author has come back to iridectomy. Notwithstanding a few brilliant successes with sclerotomy, he could not tell why it succeeded, and so could not foresee in a given case whether it promised well or not.

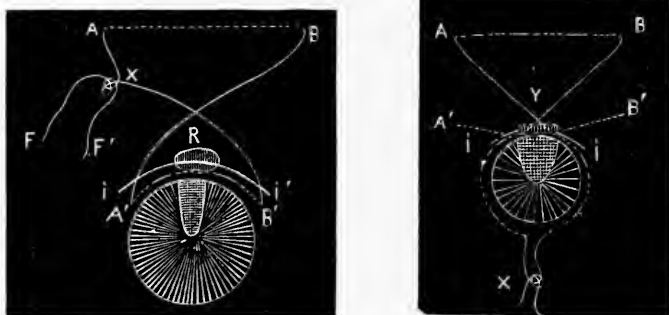
Rampoldi³⁰_{Nov. 6, '97} records a case of *glaucoma absolutum* with great pain and beginning sympathetic iritis, in which iridectomy was without result and enucleation refused. About three grammes daily of antipyrin served within a month to render the globe free from all signs of irritation. Our corresponding editor, Dr. N. Van Rijnberk, of Amsterdam, sends an analysis of the article of Snellen,¹⁰⁷⁵ designed to illustrate the utility of myotics and sclerotomy in certain cases of glaucoma. The progress of the disease may be checked for a long time by myotics, but when the obstructive changes of the anterior chamber are so great that evacuation is greatly impeded, then sclerotomy must accompany the myotic. In the later stages myotics help to fix the prognosis. If by them the pupil still contracts and the tension diminishes, good results may be expected from an operation. Pardee⁷⁷_{Nov.} reports twenty cases in which eserine was used in glaucoma. In eight of these it was without effect, and an operation was performed (iridectomy seven times, sclerotomy one). In the fourteen cases improved by

eserine the improvement was greater than in the operated cases. He thinks those cases that resist eserine will resist the operation also, and he therefore intends trying the eserine first in all cases. Galezowski¹⁷³_{Oct.} does what he calls a posterior sclerotomy "to re-establish the circulation in the posterior segment of the globe" in simple glaucoma. He makes two incisions between the superior and external recti and between the latter and the inferior rectus, prolonging the sclerotomy a few millimetres, and withdrawing the knife when it has penetrated between the sclera and the choroid. He has done this four times with "perfect success."

Walker¹⁸⁷_{July} has had very satisfying success in three cases of glaucoma by an operation he designates by the term "cyclotomy." The operation is thus described: The surgeon stands behind the recumbent patient, inserts the wire speculum, fixes the eye with toothed forceps just below the lowest point of the cornea, thrusts a very small knife through the cornea close to the point of fixation, through the iris; then, raising the handle and depressing the blade, cuts through the ciliary muscle down to the sclerotic, and then, withdrawing the knife slowly, completes the section of the whole ciliary body. By performing the last act slowly, there is no prolapse of iris. There is instant relief of the characteristic pain as soon as the section is made, and if the withdrawal of the knife be carefully done, so as to permit little aqueous to escape, the after-smarting is but little. If, however, the aqueous be lost, there is the usual aching resulting from it. Hirsch²⁵⁴_{Mar.} records three cases where iridectomy in glaucoma was followed by severe hæmorrhages, hernia of the vitreous, etc., necessitating immediate enucleation. The author found that the hæmorrhage came from the choroidal vessels. Moura⁴⁶² finds the proportions of whites, half-breeds, and negroes (in a total of five thousand four hundred and fifty-eight patients) affected with glaucoma as 1.36, 2.39, and 10.72 per cent. respectively. This greater predisposition of the negro is coincident with a more rapid progress of the disease in those attacked, and a greater cupping of the papilla. The simple chronic form is the one most frequently observed.

WOUNDS, INJURIES, AND FOREIGN BODIES IN THE EYE.—Tyler⁷²_{Sept.} had a patient who in sneezing displaced the eyeball outside the lids. Gessner²⁵⁴_{Mar.} had three cases of *enophthalmus*, or retraction of the globe in the orbit, the consequence of violent traumatism,

followed by extensive inflammation of the eyes and face. The phenomenon is explained as due to the retraction of the orbital tissues, the result of inflammatory processes. Grandclément⁶¹_{Dec. 1} described a condition which he calls *traumatic keratalgia*, a neuralgia of the cornea from slight grazing injuries. The pain and trouble may continue for years. The author thinks it due to a neuritis. According to Nuel,¹⁷¹_{June} *ruptures of the sclera* by blows with blunt bodies are situated in front of the corpus ciliare at the sclero-corneal junction in the region of Schlemm's canal. Three grades of injury are distinguished: 1. Rupture about five millimetres long, conjunctiva not torn, but bulged by the aqueous humor, iris prolapsed, anterior chamber empty, hyphæma. 2. Lens luxated under the conjunctiva, or, if this be torn, to the outside. 3. Vitreous,



NUEL: RUPTURES OF THE SCLERA.

Ligature passes from A to B beneath the conjunctiva, thence parallel with the corneal border beneath the rupture from A' to B', and is knotted at X.

(*Annales d'Oculistique*.)

retina, and choroid pushed through the rupture, generally by a retro-choroidal hæmorrhage. The site of the rupture is determined by the direction of the force. As this is generally from below or from without toward the upper and inner part, the rupture is situated in the upper and inner aspect, the eye being flattened so that its greatest circumference is perpendicular to the direction of the blow, and this passes through the corneo-scleral junction. Since the other parts of this greatest circumference are protected by the orbit, the rupture takes place at the point mentioned. The prognosis is relatively good, despite the common view as to wounds of the ciliary region. Suppuration is rare and generally due to late infection. Sometimes, however, the scleral wound does not heal, the aqueous leaks, and phthisis bulbi may result. Nuel recommends a free incision in the prominence of

the conjunctiva and sclera, and the conjunctiva sutured so that it is drawn into a roll and thus closes the scleral wound. The method of carrying out the suture is illustrated by the annexed cuts. The cornea is also punctured at its lowest point to allow the aqueous to escape, and this is repeated every day for a week.

According to Dr. Rijnerk, Dooremaal reported a case of luxation of the globe of the eye due to the careless removal of a meat-hook that had penetrated the upper lid. The canthus was cut and the lid reduced into place. Snell⁷⁶_{Apr.} had a case in which he is confident that in a wound of the upper eyelid the stick did not pierce the orbit, and yet there resulted complete *palsy of the third nerve* and optic atrophy. Zinsmeister⁸_{Sep.13} had a case of orbital injury, resulting in a permanent broad *opening into the frontal sinus*. Friedenwald¹⁰⁴_{Dec.8} had a case of injury from an umbrella thrust in the orbit, resulting in some supposed injury to the nerve, so that "*choked disk*" and *optic neuritis* followed, with loss of sight. Magnus⁶⁹_{Jan.19} notes two cases in which, after simple contusion of the globe, an *opacity of the lens* was found to exist for a short time, but passed away spontaneously. The phenomena are explained as due to epithelial degeneration and consequent afflux of more nutrient liquid than the lens can absorb at once. Hutelinson's case⁴²³_{July} of injury from a blow with a soft body caused *blindness* and numerous and long lacerations of the choroid with pigmentation of the retina. Pardee⁷⁷_{Aug.} records the details of twenty-four cases of *serious injury to the eye*, in which either other physicians (twelve cases) had advised enucleation, or which, "according to the accepted rules," should have been excised, but in only five of which was the operation finally necessary. Of the nineteen cases saved eleven had sight in the injured eye. It is, therefore, urged that enucleation should be delayed much more frequently than it is. He has never had a case of sympathetic inflammation. Coomes¹³⁵_{Oct.} had a case where a piece of copper necessitated the removal of the globe, and where the sympathizing eye grew worse thereafter and was only saved by long and careful treatment. Thus copper particles are again shown to be particularly injurious to the eye, and unless early removed endanger the sympathizing globe.

Purtscher,²⁵⁴_{June} with remarkable industry and thoroughness, has made a study of the published cases of the *traumatic paralyses of the sixth nerve*. The general impression gained from this very

exhaustive work is that this paralysis, in relation to the frequency of cranial injuries, does not appear to be common, though not infrequent as an isolated occurrence. The relative frequency of bilateral intracranial paralysis of the abducens is emphasized—28.3 per cent. of forty-six cases, a proportion vastly in excess of the bilateral paralysees of the ocular muscles generally. Of fourteen cases of monolateral paralysis eleven were upon the side of the injury. Very noticeable is the fact of the singleness of abducens paralysees; out of forty-six cases fifteen or sixteen showed persistent isolated paralysis of the abducens alone.

Badal²⁷⁴_{Sept.} writes thirty-four octavo pages to say that after a *railway accident* a patient had, as regards the eyes, certain asthenopic symptoms and a narrowed field of vision, and that it was doubtful whether he was hysterical or malingering. Barrett²⁸⁵_{Apr. 15} details six cases of visual affections consequent upon railway accidents. Of the six complainants, there was no evidence of injury in one; in another, some conjunctival vascularity; in three, some disturbance of accommodation; and in one there was hæmorrhage into the vitreous with loss of vision in the one eye. Williams¹⁰⁹_{June} reports a case in which, as a result of cranial injury, there was bilateral complete *central blindness*. To see anything he had to look sideways; the large part of the peripheral field seemed normal. According to the report of our corresponding editor, Dr. Eklund, Rossander had a case of *pulsatile exophthalmia*, the result of a severe crushing pressure of the head. The symptoms became so severe that ligature of the right carotid was undertaken, with complete success in the relief of the symptoms. Thos. Reid²¹³_{Apr.} reports a case of injury in the ciliary region by a fragment of steel which remained imbedded for three years. Four years later iridectomy was performed, and a moderately clear pupil was established, through which the patient was able to make out the figures on a watch with a two and a half convex glass.

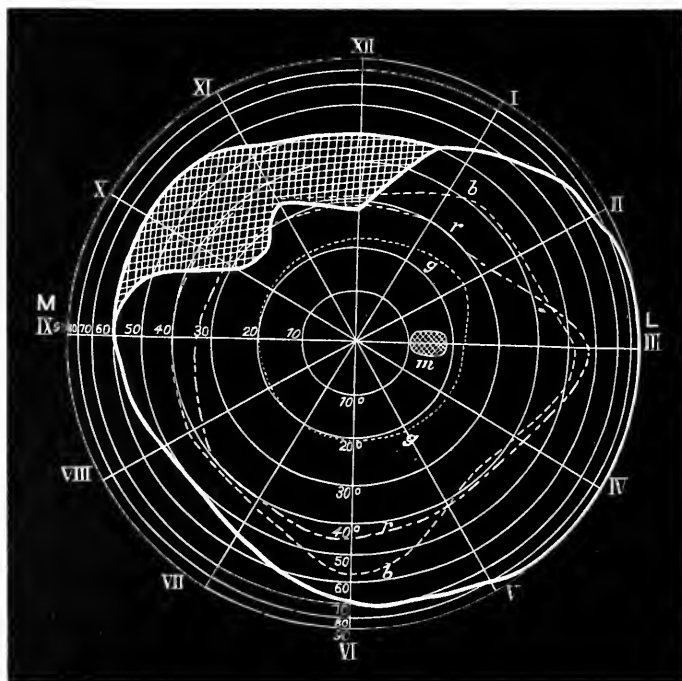
Martin¹⁸⁸_{Sept. 30} reports a case of ocular injury caused by *sulphuric acid*. Free irrigation, promptly carried out with cold water, is the best proceeding in such accidents. Baudry¹⁸¹_{June} presents a discussion with illustrative examples in detail of sixty-seven cases of *burns of the cornea and conjunctiva*, and of one hundred and eighty-nine cases of *foreign bodies* in the same. Of burns we note cases of injury from sulphuric acid, alcohol flame, molten zinc, antimony

or iron, and with lime. In twenty-four of these cases both membranes were affected. Dujardin²²⁰_{No. 16} showed a patient who had a fragment of a needle four millimetres long in the crystalline. Vision was good and no cataract existed. De Lobel¹⁷³_{June} extracted fifty-three separate foreign bodies from the eyes of a smith, with reinstatement of working vision after several months' attention. Lee¹⁸⁷_{Jan.} had a patient with a piece of granite suspended in the vitreous and having a free pendulum-like movement. There was little or no irritation. Vision $\frac{2}{4} \frac{0}{0}$, and operation was postponed. Harlan¹⁰⁷⁰₁₈₈₇ urges against the danger to the eyes of iron-workers from the use of old hammers, and cites an instance where, by constant use, the edges of a hammer had become so brittle as to allow the breakage of a small particle, which resulted in the destruction of an eye.

In Caston's case¹⁴³_{Feb.} a shot remained in the anterior segment of the eye, sometimes behind the iris, sometimes in front, and without becoming encapsulated. Pflüger³⁵³_{Aug.} thinks the prognosis of Neese (see ANNUAL, 1888, p. 90, vol. iii), as regards *foreign bodies in the posterior part of the eye*, too sombre. He cites a number of cases in which bodies retained for a long time in the eye and attended with considerable inflammatory symptoms have been successfully removed. An instance from his own practice is cited, and another is given to show that when the foreign body cannot be seen it is better to abstain from operative interference. Rodoniöff (according to the report of Dr. Maklakoff) extracted a *foreign body* from the *upper canaliculus* that had been there two months. Briggs¹⁴⁷_{Sept.} records the difficulty he had in ascertaining the existence and in extracting the softened *leather tip of a billiard cue* from the deep part of the orbit.

Bickerton²_{Apr. 28} extracted pieces of *glass from the anterior chamber* that had been there, one twenty years, another seven years. Laquer¹⁹⁰_{Oct.} gives the details of four successful extractions of foreign bodies with the magnet, in three of which the visual results were good. The sooner the operation is proceeded with the better, though one perfectly successful result was obtained fifteen days after the accident. Mellinger¹¹³²₁₈₈₇ recounts previous extractions by the magnet and adds the report of twelve cases operated upon by Professor Schiess. The extraction was successful seven times, once with normal, once with fair vision. The other cases were visually losses. A successful case of *magnet extraction* is reported by

Schwarzbach.²⁶⁷
Dec. 15, '87 The fragment was $5.3\frac{1}{3}$ millimetres long. Vision afterward "nearly as good as formerly." Many other successful cases have been reported during the year. That of Hirschberg¹⁹⁰
Feb. is noteworthy from the size of the steel splint, three millimetres long, and weighing twenty milligrammes; from the fact that it was taken from the vitreous chamber, and that the eye was permanently and wholly relieved, with perfect central vision. Cuts illustrative of the fundus at the seat of injury and of the conse-

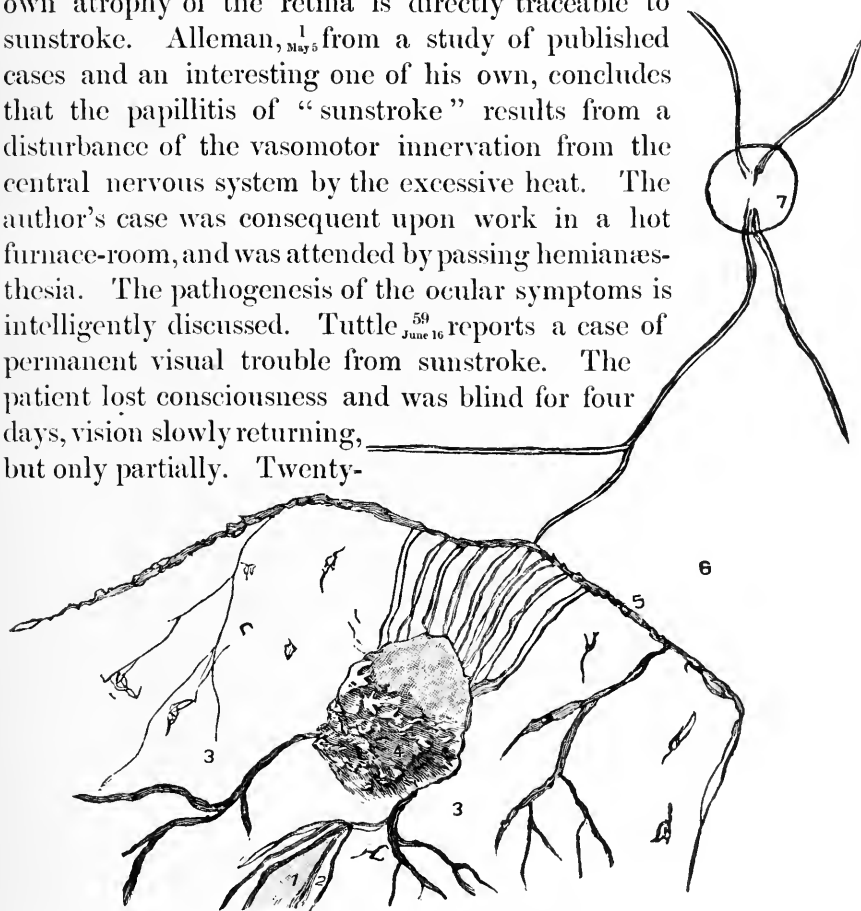


HIRSCHBERG: MAGNET EXTRACTION.
(Centralblatt f. p. Augenheilkunde.)

quent field of vision are appended. It has been noted (report of Dr. Landolt) that wounds of the eye caused by dynamite explosions are more benign than those caused by the explosion of percussion caps. It is supposed that the burning dynamite renders the metallic fragments aseptic, whereas the caps, being greased, are not aseptic and thus produce inflammatory action.

As reported by Dr. Maklakoff, Kouritzine has observed a case of partial *gangrene of the cornea* resulting from exposure for several hours to extreme cold.

Spalding⁵⁹_{Apr 28} had several cases trying to get a pension claiming blindness or severe ocular injury as a result of *sunstroke* in the army. Of four such cases two proved to be frauds; in a third, sunstroke blindness was not admitted, though he had optic atrophy due to exposure; the fourth case of blindness was due to spinal atrophy, not insolation. Tuttle,⁵⁹_{v.1,p.664} however, contends that his own atrophy of the retina is directly traceable to sunstroke. Alleman,¹_{May 5} from a study of published cases and an interesting one of his own, concludes that the papillitis of "sunstroke" results from a disturbance of the vasomotor innervation from the central nervous system by the excessive heat. The author's case was consequent upon work in a hot furnace-room, and was attended by passing hemianæsthesia. The pathogenesis of the ocular symptoms is intelligently discussed. Tuttle,⁵⁹_{June 16} reports a case of permanent visual trouble from sunstroke. The patient lost consciousness and was blind for four days, vision slowly returning, but only partially. Twenty-



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1, incision of sclera; 2, clear seam about the same; 3, discolored fundus with vessels; 4, pigment; 5, pigment border; 6, normal fundus; 7, optic nerve.

five years after the accident the patient is decidedly hemeralopic; the visual field is reduced to almost central vision alone. The author treats of the matter in reference to according pensions.

In answer to the question, "Is the *electric light* injurious to

the eyes?" Gould⁹_{Dec. 8} presents abstracts of all the published cases (twenty-three or more) of electric light injuries, and some of the conclusions are as follow:—

A study of the published cases of injury of the eyes by the electric light shows that not one was due to the use of the diffused light as an illuminant. The popular prejudice against such a use of it is absolutely without justification. All the cases reported were of scientific investigators, etc., or workmen about the light, who approached it very closely, gazed at it protractedly, and without protecting colored spectacles. The ocular injury is due, not to the supposed preponderance in the electric-light rays of violet and ultra-violet (chemical or actinic) waves, but simply to the greater number (intensity) of the usual length light waves. The symptoms of the ocular injury are possibly immediate temporary "retinal paralysis," blepharospasm, central scotomata, chromatopsia, after-images, etc. Within twenty-four hours there comes on intense photophobia, lachrymation, ocular pain, a feeling as of foreign bodies beneath the lids, conjunctival hyperæmia and congestion, pericorneal circles, etc. The attack usually lasts but two or three days; the prognosis is excellent; the treatment is simply cocaine and atropine instillations and cold or hot compresses.

Our corresponding editor, Dr. Eklund, of Stockholm, writes that Widmark has experimented with the electric light and with sunlight, and concludes that the inflammation (in rabbits) from exposure to these rays is due to the action upon the external parts of the eye and not to a retinal reflex. The light was thrown through a small diaphragm directly upon the retina without striking the front of the eye; the trouble resulting was slight, and only in the small corneal space through which the cone of rays passed. But by exposing the rest of the eye and keeping the pupil in shadow the vascularization, etc., of the external tissues and precisely to the extent of the exposure or degree of opening of the eye. Martin¹⁷¹_{Mar., July} concludes that electric-light injuries are not caused by the actinic but by the luminous rays of the spectrum. Cases are reported communicated by Drs. Dujardin and Meyer. Caudron⁷⁸_{Feb.} had a case of "electric sunstroke" provoked by looking at experiments of electric welding. Terrier²⁷⁴_{Jan.} reviews the literature of the subject, citing several hitherto inedited cases. Martin¹⁸⁸_{Apr. 8} shows that the injurious influence of the electric light

upon the eyes is not due to the chemical but to the luminous rays. Defontaine¹²⁶_{No.12,87} reports cases of "*electric sunstroke*" of the workmen occupied in electric welding. In addition to the ocular symptoms, conjunctival hyperæmia, lachrymation, photophobia, etc., there was inflammation and subsequent desquamation of the exposed skin.

Silex²⁵⁴_{Bl.18,H.1; Sept.} reviews the reports of cases in which ocular injuries followed lightning-stroke, and adds a noteworthy case in which there were corneal and lenticular opacities, the latter disappearing in six days, but being replaced by an opacity of a different and denser kind, which persisted. The author thinks the cataracts due to coagulation of lenticular albumen by the catalytic action of the flash. Buller²⁴⁹_{June} had a case of ocular injury from lightning. There was loss of consciousness and great collapse, temporary paralysis of all the muscles of the upper part of the body, including those of the eyes; no signs of inflammation in the eyes; the right one regained vision, but the vision of the left remained impaired, and the globe was turned inward and upward. There were manifold mechanical lesions. Chichkine¹⁰¹⁶_{No.10} reports a case of double cataract in a boy of eleven, the consequence of a lightning-stroke that burned the body and face rather badly. Schleicher¹¹³³ reports a case of cataract following lightning-stroke, and abstracts twenty-nine observations of lightning injuries previously published. In fourteen of these there were cataracts, eight being binocular. The author thinks the lenticular trouble due solely to mechanical injury. The chemical theory is unnecessary. Hess,²⁷⁴_{Sept.} from experiments in the artificial production of cataract by the *discharges of a Leyden jar*, concludes that the cataract is caused by destruction of the lenticular epithelium and the consequent penetration of the aqueous humor.

SYMPATHETIC INFLAMMATION.—The *symmetry of sympathetic affections* seems to be a strong argument against the theory of Deutschmann. Such a case is that of Leplat,²⁹³_{No.1} where the wound of the enucleated eye and the resulting cicatrice were in the lower segment. The experiments of Mazza-Andreas²⁷⁴_{Sept.} were entirely negative as regards the passage of the staphylococci from one eye to another. To us the evident neural nature and intermediation of the disturbance is strangely neglected. From experiments upon animals Randolph²⁴⁹_{June} concludes that *aseptic wounds of the eyeball*, whether

of the ciliary region or not, produce little disturbance. So far as the pathogenesis of sympathetic ophthalmia is concerned, his experiments do not show that the propagation is *via* the optic nerves and sheaths. The local inflammation did not travel any considerable distance along the nerve. The author inclines to think that infection plays a rôle in the production of the sympathy. Theobald⁵⁹_{Feb. 25} points out a suggestive analogy in reference to the *pathogenesis of sympathetic ophthalmitis*. He had two cases of reflex paralysis of the accommodation from dental irritation, and says that "there is a very close parallelism between the sequence of events which must have taken place in these cases, and that which occurs, according to those who believe that the disease is a reflex neurosis, in sympathetic ophthalmitis. In the one case we have, as a result of persistent irritation at the peripheral extremity of branches of the dental nerves, structural changes in ganglionic centres having connection with the fifth and third nerves, of such a character as to produce paralysis of certain of the ocular muscles, usually upon the side corresponding with the location of the diseased tooth. In the other we have, in consequence of persistent irritation of the ciliary nerves (in the primarily affected eye), structural changes brought about in ganglia connected with the fifth nerve, some of which are central, and these, in turn, probably through the medium of vasomotor or 'trophic' nerves, leading to the development in the opposite eye of the condition which we call inflammation."

Meighan's²¹³_{May} case of impaction of a piece of metal in the eye for ten years adds another instance of the possibility of the long retention of a foreign substance without absolute destruction of the fellow eye from sympathetic inflammation. It is to be regretted that the affected organ was not removed before the opposite one became involved. Reid²¹³_{Apr.} had a case of corneal ulcer and prolapsed iris followed within a month by sympathetic ophthalmia of the other eye. The patient was a child of six years, of decided phthisical tendency, and suffering during the attack with pulmonary congestion and pleurisy. The exciter was enucleated and the sympathizer steadily improved. Alt³¹⁷_{Apr.} concludes that *reflex action* is the main factor in sympathetic irritation, but that in sympathetic inflammation there is direct transmission of the *materia peccans*. Van den Bergh¹⁷¹_{Sept.} records an unfortunate case of total *blindness from sympathy*, resulting from an operation, under strict antisepsis, of

excision of a corneal staphyloma. Ducamp³⁴⁸_{p. 207} on the strength of two of his cases, recommends the amputation of the anterior segment in all cases where the original lesion of sympathetic phenomena is situated in that part of the eye.

Panophthalmitis.—The *enucleation of an eye attacked by panophthalmitis* was the subject of a discussion at the French Congress of Ophthalmology. Panas²⁷⁴_{July} advocated this operation on the grounds that the suppurating organ may become the seat of general infection, and thus result in meningitis and death. Whenever the treatment fails to arrest the suppuration we should enucleate. Even when the panophthalmitis is at its height, the eye should be removed, unless there be general infection, or the patient have albuminuria, diabetes, etc. Motais, Gayet, and Fieuzal adhere to this view, but Abadie opposed it, fearing that septic matter escaping during the operation might give rise to a diffuse suppuration. He prefers a free transverse incision through the suppurating eyeball. Vacher and Galezowski object upon different grounds. They say the greater number of panophthalmic cases are consequent to cataract operations, and that it is cruel to a patient who has just passed through such an operation to undergo another as dangerous as enucleation, which, according to Galezowski, may cause death. It seems that in the cases where death follows enucleation done during panophthalmitis the question should be asked whether infection had already taken place, or whether the patient could have been saved by earlier removal. Motais describes two cases and Webster²⁴⁹_{Mar.} one, seeming to prove this view to be correct. Martin¹⁷¹_{June} is an enthusiastic advocate of enucleation. He does not exclude from cataract operation patients suffering with diabetes, albuminuria, etc. Rolland¹⁷³_{July} in eight years has enucleated eighty eyes at the height of the panophthalmic inflammation, and without a single failure. He takes great pains to antisepticize the field of operation, injecting solutions by the aid of a syringe in the sclerotic cavity prior to the operation and thoroughly cleansing the orbit afterward, renewing the dressings every twenty-four hours. Rolland¹⁷³_{Apr.} had four cases of panophthalmitis *without exposed wound* and without co-existing general infection. He concludes that the germs penetrated by the way of the intact respiratory organs, or that some nutritional disturbance of the interior of the globe formed a suitable nidus for their multiplication. Panas¹⁷³_{May} reported a case of

enucleation during panophthalmitis in which there was sympathy of the opposite eye three weeks after a cataract operation. In eight days the patient died, having had albuminuria. The autopsy showed extensive purulent infiltration of the optic nerve from the operated side to its fellow, and the lung was the seat of an abscess. The kidneys showed old interstitial inflammation. He, however, persists in the belief in the utility of operative procedure.

SECTION IV.

MEDICAL OPHTHALMOLOGY.

According to Panas²¹²_{p.536,'87} the pustules of *small-pox* never develop on the cornea or on the conjunctiva; the farthest they go is the free edge of the lids. The corneal lesions in small-pox are, he thinks, the consequence of the maceration of corneal epithelium in the septic liquids retained by the eyelids. Antiseptic lotions are, therefore, principally indicated. The iritis that is sometimes seen in small-pox is of rheumatic nature. Our corresponding editor, Dr. Landolt, reports that Poncet⁷³_{p.33} has studied three kinds of *leprosy*: (1) the Leonine, or tuberculous form; (2) the Antonine, or nervous mutilating form; (3) the Lazarine, or spotted ulcerous form. The cause of the disease is a special microbe found in giant cells as well as free. The iris becomes the seat of colonies, and the parasite reaches the ciliary processes, but the number decreases toward the optic nerve. The lesions show that it proceeds from the surface to the inner parts of the globe. In the beginning the lesion is circumscribed, and does not seem to be a symptom of general infection. Panas²⁷⁴_{Nov., '87} divides the ocular affections of *leprosy* into the anæsthetic and the tuberculous forms. In the first, lagophthalmos, xerosis of the conjunctiva with iritis, cataract, and phthisis bulbi are frequent; in the second, the cornea and conjunctiva are the chief seats of the lesion, though sometimes the iris, lens, and whole globe become implicated. The favorite seat is the cornea-scleral border, proceeding thence into the corneal substance and to the deeper tissues. All applications are powerless.

Flint¹⁹_{Sept 15} reports his own case of *herpes ophthalmicus*. There was no stage of pain, etc., before appearance of the herpes; this last extended over the head, face, lips, and into the mouth, the suppurative stage being long and tedious, and continuing longer

in the eyes. The author says *eyes*, though elsewhere noting that the inflammation never extended beyond the median line. Gould¹¹⁹_{Oct., Nov.} had a severe and peculiar case of *herpes zoster ophthalmicus*, due to exposure of the side of the face to a cold draught of air when the patient was overheated. The intense pain, congestion, photophobia, etc., existed for thirty-six days and were relieved by pilocarpine. The eruption did not appear until fifty-five days after the onset of the disease, and with it there was plastic iritis. It is suggested that a more appropriate name would be ophthalmoneuritis. As a result of the severe ordeal, the globe, after final complete cure, was found to have lengthened and the corneal symmetry to be disturbed, so that Sph. — 1.25 D. \bigcirc Cyl. + 3.75 D. ax. 180 was required to give perfect vision to what was formerly an emmetropic eye. The conclusions of the author are as follow:—

1. Ophthalmoneuritis is an inflammation of the nerves of the ophthalmic branch of the fifth, with implication of its vasomotor and trophic fibres and possible extension of the inflammation to the optic nerve.

2. It may be caused by exposure to a cold draught of air, and is probably similar in essential nature to the lesion resulting in facial paralysis when the seventh nerve is affected from the same cause.

3. The symptoms may be intense pain, lachrymation, photophobia, conjunctivitis; later, those of serous iritis, and, still later, those of plastic iritis and herpes zoster ophthalmicus.

4. Pilocarpine may give relief from the long-continued pain and tension of the early stages of the affection.

Ziem,¹⁹⁰_{Dec., '87} after referring to previous cases of ocular disease coincident with *nasal affections* that had come under his observation, gives the details of two cases of iritis due to nasal suppuration. In the first case the origin of the nasal trouble was from a suppurating tooth. In the second case no such cause was found and relief of the ocular trouble followed that of the nasal. Taylor⁶¹_{Nov. 17} describes four cases in which *nasal disease* was the demonstrated origin of reflex ocular troubles of a severe and persistent kind, such as lachrymation, conjunctivitis, trachoma, keratitis, etc. Clark²³³_{Aug.} refers to two similar cases and gives the details of a case of lachrymation and conjunctivitis due to ulcerated mucous membrane of the nose. Emrys-Jones⁷⁶_{Apr.} reports a case of

optic atrophy associated with dropping fluid from the nostril. The patient had suffered for twelve years with chronic influenza. Reference is made to seven cases previously recorded. Brain symptoms were present in six out of eight. In the case reported the atrophy does not seem to have followed neuritis, and no brain symptoms were present. The more atrophic optic nerve is upon the same side as the more copious discharge. Meyer⁷⁶_{Apr.} referred to two cases known to himself, and Benson mentioned a case in which there was the dropping of fluid without eye symptoms. Rothholz⁶⁹_{Dec. 29, '87} urgently emphasizes the frequent pathological relations of the nose and eye, especially in scrofulous children, and shows how either organ may set up inflammatory and reflex action in the other. Schmidt-Rimpler¹¹_{No. 24} had a case of unilateral blindness following an operation for removal of *nasal polypi*. Maxwell⁷⁶_{Oct.} noticed that *chronic nasal catarrh* is a frequent cause of accommodative asthenopia. The glasses prescribed during the existence of the catarrh were no longer needed after the cure of the nasal disease, whose action was reflex. Faravelli and Kruch³⁰_{No. 3} found that out of thirty-five cases of disease of the tear-duct there were thirty with nasal disease (hypertrophies, polyps, etc.), and, in the rest of the cases, atrophy of the mucous membrane, deviation of the septum, etc. They think that the majority of diseases of the lachrymal duct are due to nasal affections.

Fortumet¹¹³¹ and Augagneur²¹¹_{July 8} contend that the phlyctenular ocular troubles of so-called scrofulous children are due to rhinitis induced by infectious material from eczema, impetigo, etc. The most important clinical contribution upon this subject is that of Gruhn,³⁴_{July 3} who gives a report of thirty-eight cases of dacryocystitis with nasal disease. In all but two the disease of the lachrymal sac and duct coexisted with some nasal trouble, in nineteen there was rhinitis atrophicans fetida, in six rhinitis atrophicans sine fetore, etc., etc. In many cases the history showed the nasal disease precedent to that of the duct, and the belief is expressed that it was generally so. It may even happen that the nasal trouble may pass away and that of the duct and sac continue. The case of Ziem¹⁹⁰_{Aug.} is noteworthy. As a result of traumatism the eye had for three years shown irritation and symptoms of cyclitis. Its enucleation had been agreed upon, but as there was at the same time swelling, etc., of the nasal mucous membrane, this was first pro-

ceeded against with nasal douche, and quantities of malodorous secretion washed out. The eye began at once to improve and the enucleation was given up. The notes of two highly interesting cases⁵⁹_{Feb.25} of reflex paralysis of accommodation with mydriasis, due to *dental irritation*, are given by Theobald. The difficulty is believed to have been in the ophthalmic or Gasserian ganglion, and not only reflex, but structural, from the slowness with which the ocular paralysis disappeared after removal of the dental irritation. We would ask if the original irritation is necessarily removed with the offending tooth? Repair of the tissues would occupy some time.

Snell²_{Nov.24} cured a case of orbital sinus by extracting a broken tooth. Widmark¹⁷¹_{Sept.,Oct.} cured a case of complete unilateral blindness by ordering the extraction of carious teeth. Riva¹⁷¹_{Sept.,Oct.} had a case very similar, the dental difficulty being caused by a fragment of a dental drill in the root of the tooth. Galezowski⁷⁸_{Oct.} returns to this theme, citing two cases of accommodative asthenopia due to dental caries, one case of loss of vision from extraction of a tooth, one of recovery of vision by the same means, and, finally, one of exophthalmia of one eye with optic neuritis and complete blindness, in which, finally, extraction of an old carious molar cured the pain and exophthalmia; but the blindness, due to an atrophy of the nerve persisted. Unilateral mydriasis, instead of being, as usually supposed, an invariable index of ataxic or syphilitic paralysis of the third nerve, is due, according to Galezowski, eight times out of ten to dental changes. An example of mistaken diagnosis is given. Our corresponding editor, Dr. Pulido, of Madrid, Spain, reports a case of temporary monocular blindness due to a carious tooth. Vision returned and the neuralgia disappeared after the extraction of the tooth. Marlow¹_{Apr.14} gives the details of three cases of corneal congestion and swelling at the border, which persisted during long-continued use of the usual local and general treatment, but which disappeared rapidly and completely when the dental irritation was removed. R. J. Polden²⁰⁶_{Nov.,97} cites a case of tetanus following the fact of the patient's eyes having been "gouged out." The trismus was relieved by one-fourth grain of extract calabar bean thrice daily. Uhthoff⁴_{Sept.3} reports a case of abnormal monolateral elevation of the upper eyelid in movements of the lower jaw. In chewing the lid moved in a peculiar jerking

manner. There was a paresis of the lid. The author explains the phenomenon as due to an abnormal congenital connection between the oculo-motor nerve with the nucleus of the third branch of the trigeminus.

A case of optic neuritis coincident with *otitis media* is reported by Keller,³⁸⁵_{Nov. 6} and one of metastatic irido-choroiditis, with abscess of the neck and suppurative otitis, by Pomeroy,¹¹³⁵_{Sept. 15} that resulted in loss of the eye. Kipp,¹¹³⁵_{Sept. 15} describes three cases of transient bilateral horizontal nystagmus in connection with purulent inflammation of the middle ear. In one case pressure on the mastoid swelling would set up the nystagmus, which continued for a minute or two after the pressure was removed. A review of similar cases is appended. D'Arsonval,¹¹_{May 23} relates that after gazing for a few moments at an incandescent electric light he became *deaf* for an hour or more. The experiment was again repeated with the same result. Evetsky,²⁷⁴_{Nov., Dec., '87} summarizes the only two cases of *post-diphtheritic ophthalmoplegia externa* prior to his own. All were light cases of diphtheria of the throat in children of eight or ten years of age. It seems hard to explain the non-implication of the intraocular muscles if the lesion in these cases was nuclear. Some authorities, and Mendel's case examined post-mortem, favor the view that the lesion is due to a peripheral neuritis. Venne-
man,²⁷¹_{July, Aug.} proposes to designate all fibrinous inflammations of the conjunctiva by the term conjunctival croup or conjunctival diphtheria, according as the inflammation is superficial and benign or deep-seated and malignant. Diphtheria of the conjunctiva, therefore, should be understood to refer to ocular localization of the general infectious malady known as *diphtheria*. These cases alone demand an anti-microbian treatment. The author recommends mucilage of tannin from its success in the relief of the throat affection. Abadie recommends lemon-juice applied to the conjunctival surface every six hours. Dissolution of the false membrane by the juice of fresh pine-apple, a solution of papaine, the juice of *Carica papaya*, or by a concentrated solution of animal pepsin is also recommended.²¹⁷_{Apr. 7} the parts to be touched three times a day with either of these.

Landesberg,¹⁹⁰_{Feb.} had a case of chronic inflammation of the uveal tract finally resulting in iritis, vitreous opacities, and cataract, all of which followed an operation of *goitre extirpation* in a girl of

twenty-five years of age. To the general nutritional rôle of the thyroid is ascribed the ocular troubles. Lloyd¹¹⁹_{Apr.} had a case of rapidly fatal *exophthalmic goitre*, the patient dying in three days after pronounced symptoms had appeared. Taylor¹⁹_{Apr. 14} gives interesting notes of eight cases designed to emphasize the importance of an early recognition of the affection. One was acute and accompanied with bronzing of the skin. In three cases there was albuminuria; in two, œdema of the lower extremities. The author says the exophthalmos is late to appear and marks the height of the disease. Von Graefe's sign commonly appears before the exophthalmos. Our corresponding editor, Dr. Landolt, writes that new light is thrown upon the subject of *exophthalmic goitre* by Ballet, who describes a case with paralysis of the third, fourth, sixth, and seventh pairs of cranial nerves, a phenomenon hitherto but little observed. The iris and ciliary muscle were functional, but there was double facial paralysis. The author thinks the origin of Basedow's disease is central, and that it consists essentially in a paralysis of one or several nuclei of the pneumogastric. Stiller¹⁴_{Oct. 17} reports a remarkable amelioration of the symptoms of exophthalmic goitre in two cases by the influence of high latitudes. Valieri⁶⁷_{Sept. 15} reports three cases greatly relieved by *cannabis sativa*; thirty centigrammes (gr. $4\frac{1}{2}$) of cannabine (Gastinet) were given in sugar of milk. Brower⁶¹_{Nov. 3} reports several cures from the use of *strophanthus*. At first two-drop doses of the tincture were given every six hours and increased to ten drops. Roberts¹⁹_{Apr. 11} advises a surgical operation to reduce the ocular deformity when it is reasonably certain that further diminution of the prominence is improbable. He freshens the lid edges and puts a stitch at the outer canthus. Rockwell gave the histories of two cases notably relieved by treatment, consisting of dietetic regulation, internal medication, and applications of electricity to the neck. Bardeleben³⁰¹_{Ed. 26, 11, 1, 2} has, since 1876, performed twenty-four operations for the extirpation of goitre, fifteen being total and nine partial; of the former, five proved fatal. In ten cases no symptoms of cachexia strumipriva or myxœdema have appeared in periods varying from one to four years.

Guttmann⁶⁹_{Mar. 20} observed a peculiar reflex relation of the corneal branches of the trigeminus to respiration. In a child poisoned by an overdose of atropine *respiration* was interrupted whenever the cornea was touched by the finger. Hirschberg⁶⁹_{Mar. 20} noticed the

same phenomenon in children suffering from suppuration of the conjunctiva upon application of the lapis stick. Wertheimer and Surmont,¹⁸¹_{Aug.} believing that the reflex route of the phenomenon of *sneezing* upon exposure of the eye to light is through the corneal ciliary fibres and the ethmoidal branch of the ophthalmic of Willis, anæstheticized the cornea with cocaine in a subject whose lids it was impossible to open without bringing on most violent paroxysms of sneezing. In ten minutes exposure of the cornea resulted in no sneezing at all. Sandmann⁴¹_{Mar.29} explains the phenomenon, which he has often observed, in the same way. Comini³⁰_{No.1,3} gives the histories of nine cases of mydriasis in *phthisis*. Sometimes it was bilateral, but usually upon the right side and coincident with right-sided apical lung disease. In some cases there was photophobia and accommodation paresis. Direct involvement of the sympathetic is thought to be the cause by the author, but Rampoldi thought the phenomenon was due to reflex irritation. Alexander⁶⁹_{No.11} contributes two cases of blindness due to *whooping-cough*. In the first, the pupillary reaction was normal and the lesion is ascribed to a cerebral œdema between the tubercular quadrigeminæ and the occipital lobes. Death ensued. In the second case there was pupillary immobility and optic neuritis due to meningitis. There was partial restoration of vision, but optic atrophy followed.

Zieminski¹⁷³_{Dec. '87, Jan.} concludes that spontaneous profuse hæmorrhage from the vitreous chamber in adults is due to the putrid decomposition of intestinal fecal matter, producing blood changes that predispose to hæmorrhages. Where this autointoxication is not the cause, it may be sought for in an essential hypertrophy of the heart. Rampoldi³⁰_{No.6} reports a case of acute convergent strabismus due to anæmia from *onkylostomum*, that disappeared in fourteen days with riddance of the intestinal parasites. Panas²⁷⁴_{Mar.} explains a case of spontaneous hæmatoma of the orbit as a reflex hæmorrhage due to vasoparalytic congestion of the head from *gastric disease*. According to our corresponding editor, Dr. Landolt, Zieminski has also observed several cases of vitreous hæmorrhage during digestive troubles. Despagnet¹⁷³_{Sept.} had a case of corneal infiltration and anæsthesia, following gastric fever. Several cases similar to the last are mentioned⁷⁷_{Apr.} by Martinache. Hogg²_{July 21} relates a case of strabismus and amaurosis due to *ascaris lumbricoides*.

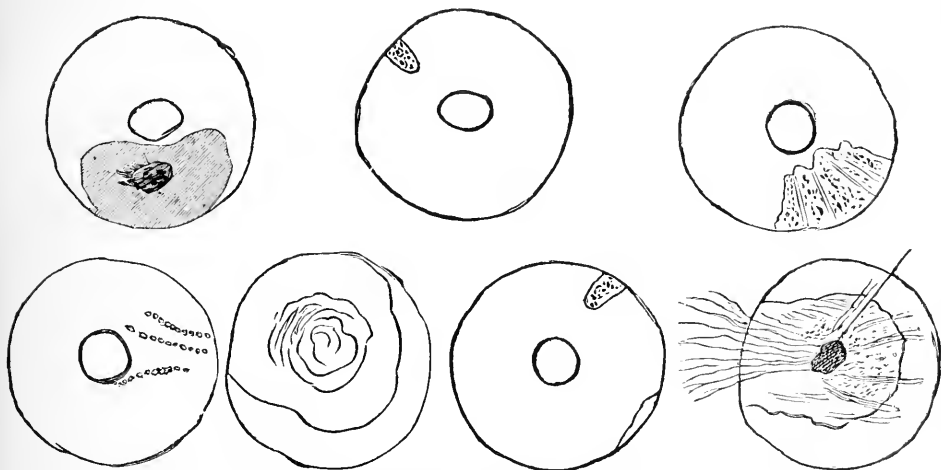
Kollock⁴⁰_{June} cites in brief a number of cases designed to illustrate the connection of ocular affections with functional disorders of the *female sexual organs*, especially those occurring about the age of puberty. Asthenopia, retino-choroiditis, ocular pain, etc., are particularly noticed. Allusion is made to four cases of lachrymal abscess during *pregnancy*, and also to various diseases of the eyes in mothers coincident with *nursing*. Zieminski⁴¹_{Sept. 17} describes a number of cases of hæmorrhages into the vitreous during the year of puberty. Pascal had a striking case of *vicarious menstruation* from the eyes, the blood appearing to ooze from the conjunctival capillaries and running over the cheeks. With the cure of the dysmenorrhœa, the phenomenon did not recur. Deniau²⁵_{Sept. 20} reviews the literature of the influence of *utero-ovarian maladies* upon the eyes. He says we are authorized to believe in the existence of a true amenorrhœic phlyctenular conjunctivitis, and cites an illustrative case.

Galezowski¹¹⁸_{Feb.} says *rubeola* may sometimes have phlyctenular kerato-conjunctivitis for its initial symptom. The ophthalmia frequently accompanies rubeola, generally appearing when the eruptive disease is declining. It may rarely precede by a long period the other phenomena of rubeola, and in exceptional cases the ocular symptoms and fever may exist without the cutaneous eruption. Valude²⁴_{Apr. 1} and Trousseau¹¹³⁶ have also seen phlyctenular conjunctivitis with diphtheritic characteristics as a result of rubeola. McHardy⁷⁶_{June} enucleated the eye of a child of six years with localized *tubercular choroiditis*. The constitutional symptoms at once subsided. The specimen showed detachment of the retina. In the case of Gallenga, the inoculation experiment and the microscope showed the correctness of the diagnosis. Fuchs⁶¹_{Sept. 29} advised the enucleation of an eye with tuberculosis of the iris to protect the organism. Valude¹⁵²_{Aug. 7} failed in his experiment of trying to inoculate the mucous membrane, but nodules were produced when the deeper-lying neighboring cellular tissue was reached. The present condition of ocular tuberculosis is summed up in the inaugural dissertation of d'Estienne, of Lyons. The case of Schmeller¹¹³⁷ is unique in the fact that it is the sole reported case of undoubted tuberculosis of the iris permanently cured by excision (iridectomy) of the iritic tumor. Its tuberculous nature was proved by microscopic examination and inoculation experiments. The report con-

tains a review of the question historically and critically. The cases reported by Lawford⁴²³_{July} are believed to have been tuberculous. The enucleation in one case was followed by restoration of health. In both cases one of the parents died of phthisis. In neither case was there any inoculation experiment or microscopical demonstration of the bacillus. Lawford thinks the second case shows that in tuberculosis of the iris nothing short of enucleation should be advised.

Hutchinson⁴²³_{July} had a case of corneal ulceration that it seemed necessary to ascribe to the influence of *gout*. In another case, where iritis, corneal ulcers, and some cyclitis may have been due to inherited gout, Hutchinson advised a change from the cold, damp English climate to a tropical one less favorable to the disease. There was a complete cure. A third case of Hutchinson's, of double optic neuritis in a patient where no other discoverable cause except inherited gout existed, seemed to indicate this last as the real agent. Le Roy²¹_{Dec. 25, '87} treats of the *rheumatic conjunctivitis* he has several times observed. Once only an iritis supervened. The symptoms are not severe and last for but five or ten days. To the interesting testimonies of Bull, Javal, Landolt, Poncet, and Sedan (ANNUAL, 1888), as to the diseases of the eyes consequent upon *malaria*, we have this year the convictions of other observers, rendering the fact more positive. Brunt⁵⁹_{July 14} reports the details of six cases of malarial retinal hæmorrhage. All were middle-aged males, the victims of chronic malarial poisoning, enlarged spleens, etc. Both eyes were affected in five of the cases; the hæmorrhages were usually multiple; there was slight retinitis and papillitis; the vision was impaired according to the location of the hæmorrhage. The tendency is toward recovery as the general malarial affection is conquered. The hæmorrhages are ascribed to no special morbid process, but simply to the poverty of the blood induced by the malarial poison. Tuppert had two cases of intermittent inflammation of the eye in a neighborhood free from malaria. The first patient had hypopyon every four weeks, and the second every fourteen days had pain and inflammation of the right eye coincident with indisposition. Under quinine treatment the pain appeared exactly on time, but in the right knee, where it continued to appear every fourteen days for three years, returning then spontaneously to the *left* eye again. Tangeman⁵³_{Nov. 1}

presents the report of three "masked cases of malaria in eye practice;" the ocular symptoms were intense, consisting of conjunctival congestion, photophobia, and lachrymation, swelling of the lids, pain, etc., with periodical exacerbations. Large doses of quinine served to bring about cures of the local and systemic disturbances. The vesicles were located in corresponding positions upon the two corneæ. Van Millingen¹⁹⁰_{Jan.} presents six cases of a peculiar keratitis associated with intermittent fever. Illustrative cuts of the disorder are shown herewith. The peculiarity of this keratitis consists in a superficial erosion of the temporal border of the cornea, or, more infrequently, in a fungus-like erosion at some



VAN MILLINGEN: A PECULIAR FORM OF KERATITIS IN INTERMITTENT FEVER.
(*Centralblatt f. p. Augenheilkunde.*)

other point of the periphery. At first sight it seems like a case of mechanical injury in which the epithelium has been broken off from a limited portion of the cornea. The clear area soon passes over into a cloudy ulcer, gradually enlarging toward the pupillary space, and penetrating the deeper layers of the cornea, but not perforating the last. From the infiltrated spot radiate stellate parenchymatous prolongations into the adjacent portions of the cornea. The iris and uveal tract are not implicated. In the beginning there is local pain and a feeling as of a foreign body in the eye, with lachrymation and photophobia. In the second stage, of extension and deepening of the ulcer, there is ciliary neuralgia. The most constant and the most important symptom is the anæsthesia of the cornea, even in

the unaffected parts, and sometimes persisting for a long time after convalescence and cicatrization. Paresis of the externus and inferior recti muscles was observed in one case. Healing is slow, and the prognosis as to vision is grave, owing to corneal cicatrices that are formed. Even the clearer parts are transversed by stellate rays of opacities, thus spoiling the hope of successful iridectomies. The author has no doubt of the malarial origin of the affection, but as to the direct cause of the desquamative process and the anæsthesia no explanation is advanced, except the analogy of the decubitus of spinal lesions or other exhaustive ailments. In the St. Petersburg Institution ²¹_{Oct 22} cases of irido-choroiditis following severe recurrent fever occur every year.

Moore ¹_{Mar 21} presents us with a historical *résumé* of the ocular affections in *diabetes*, with a report of the cases occurring in the author's practice for the past ten years. The following is his summary:—

1. In view of the recorded facts, shall we not urge the examination of the urine for sugar in every obscure ocular affection? 2. Cataract occurring in a diabetic may be extracted without danger if the patient is previously treated for the general disease. 3. Retinitis occurring in diabetes is usually associated with vitreous hæmorrhages, and this is a point in favor of the disease rather than retinitis from kidney affection. 4. Diabetic amblyopia is usually associated with central color scotoma for red and green, with visual fields intact, and does occur independent of amblyopia from tobacco and alcohol, as shown by our cases. And, further, diabetes can be diagnosticated by amblyopia when no diabetic symptoms exist. 5. All the diabetic affections of the eye are the result of poor nutrition produced by the disturbance of the glycogenic function, and the more marked the disturbance the more profound and more deep-seated the ocular affection. 6. The changes occurring in the eye are also taking place in other tissues of the body at the same time.

The statistics of Miley ⁷⁶_{Feb} concerning the prognosis of neuro-retinitis in *Bright's disease* are of exceptional value. The basis of the inquiry was furnished by the cases of acute and chronic renal disease occurring in the London Hospital during the years 1884, 1885, 1886. The prognosis in such cases is most grave. Dr. Miley's conclusions are thus summarized: (1) the retinal changes occur late

in the disease; (2) their presence appears to affect the prognosis very materially for the worse, the mortality in hospital among the affected cases being at least doubled; (3) the prognosis is so bad that not one has lived eighteen months after the changes have been noted; (4) the ophthalmoscope, therefore, affords a most valuable index as to the course any given case of Bright's disease is taking (except, perhaps, in pregnancy cases), unless, indeed, it be supposed that the mortality of the cases considered happened to be exceptionally high, independently of the causes at work which produced the coincident neuro-retinitis.

Weeks²⁴⁹_{sep.} gives the details of the histological examination of six globes removed from persons suffering from *albuminuric retinitis*, one of which is unique in that it was one of monocular, hæmorrhagic, albuminuric retinitis in which secondary glaucoma followed, the other eye remaining normal. The conclusions are that there is little inflammatory action, and there is extravascular œdema from escape of the elements of the blood, due, probably, to impaired nutrition of the vessel walls. The ganglion cells are greatly enlarged. Fatty degeneration of Müller's fibres was not observed. Two classes are made of the affection, one depending on the condition of the blood brought on by kidney disease, and the other depending on a diseased systemic condition of the arteries, capillaries, and even veins. Maguire²_{July 14} discusses the retinal changes in Bright's disease. Of the three possible causes of the characteristic white spots, inflammation, preceding hæmorrhage, and a degenerative process, the author believes the last is almost the exclusive one, since the spots are generally at a distance from the vascular trunks, and neither traces of blood-pigment nor of inflammation are found near them. The causal relation between the elevation of tension and the hæmorrhages is apparent, and in cases of granular kidney it may rise so high as to cause hæmorrhages in various parts of the body. The author thinks the white degenerative spots are also caused by the same elevated arterial tension. When arterial tension is high, capillary circulation is slow, and, the retinal arteries being of small volume, the foci of degeneration are where the arterioles have the smallest volume, that is, about the macula where nutrition is most deficient. From this reasoning it becomes clear why albuminuric retinitis is rare in amyloid kidney in which there is no increase of arterial tension. The prog-

nosis in albuminuric retinitis is therefore grave, both as to vision and as to life, since it is a serious abnormality of the circulation.

The case of Anderson⁷⁶_{Feb.} also bears upon the question. The patient was a girl of nine years, pale and wasted, but showing no œdema of face or limbs. There was severe double neuro-retinitis, with hæmorrhages, and a pale exudation in the papilla and retina. Upon the nasal side there was extensive detachment of the retina of both eyes from subretinal effusion, rapidly increasing in size. The child died about three months after the first complaint of visual defect. The post-mortem examination showed advanced fibroid contraction of the kidneys, marked fibrosis, and hæmorrhages. The retinæ were separated from the choroid by a clear, straw-colored fluid. The rarity of such cases of retinal detachment or of fibroid kidney in children, as also the absence of œdema, might readily cause them to be overlooked until uræmic symptoms appeared. Cocks⁹_{Mar 24} gives reports of three cases of uræmic amblyopia without ocular lesion to illustrate the fact that amblyopia Brightii may occur without retinitis albuminurica. The eyesight recovered with the disappearance of the nephritic troubles. The lesion in these cases is ascribed to a functional disturbance of the visual centres in the brain and the retinitis albuminurica, of course, from intraocular lesions. The two conditions may exist separately or may co-exist in the same person.

Concerning the *albuminuric retinitis of pregnancy* several papers have appeared during the year. The conclusions of Pooley⁹_{Feb. 4} are as follow:—

1. In all cases of pregnancy, not only should examinations of the urine be systematically made, but the eyes should be examined with the ophthalmoscope, since in a large proportion of cases where eye troubles exist the patients make no complaint of disorders of vision. Frequently such troubles can be detected with the ophthalmoscope long before any disease of the kidney is shown in the urine.

2. In uræmic amaurosis, without changes in the eye visible to the ophthalmoscope, even should the usual accompanying symptoms, such as dizziness, nausea, and threatened convulsions, be absent, their supervention is soon to be anticipated and the immediate induction of premature labor is indicated, without waiting until the life, as well as the sight, of the patient is in danger.

3. In neuro-retinitis the induction of premature labor is not only justifiable, but urgently demanded. In some instances it is called for even in the earlier months of pregnancy.

4. It is required in cases of eye trouble recurring in successive pregnancies. A woman having once suffered in this way during pregnancy, the relationship of cause and effect should be fully explained both to herself and her husband.

Fryer⁷² gives the details of a case of impaired vision in a pregnant woman appearing in about the fifth month of gestation. Examined in the sixth month by the ophthalmoscope, there was found typical albuminuric retinitis without hæmorrhages. The urine was loaded with albumen, diminished in quantity, of a specific gravity of 1028. There had been no symptom of kidney lesion, no œdema of any part. Premature labor was advised, but deferred, with rapid decrease of vision to a mere perception of light and continuous cephalalgia. Premature labor, however, was finally carried out. There were no convulsions during labor, and health finally returned, except that complete blindness followed. The retina became apparently normal in appearance, but optic atrophy was plain. Fryer quotes the conclusions of Dr. Howe, that, where the albuminuric retinitis appears prior to or during the seventh month of gestation, the rule is that the patient becomes blind, death often occurring from convulsions during labor. Thompson¹⁹⁰ induced premature labor in a woman, in the eighth month of her pregnancy, who had become completely blind in nine days. The result was happy, vision— $\frac{2}{5} \frac{0}{0}$ and $\frac{2}{3} \frac{0}{0}$ —returning in a few weeks.

The case of Wadsworth⁹⁹ is of interest, as showing retinal detachment, with extensive choroidal changes. Visual deterioration began about the seventh month, preceded and accompanied by moderate œdema of the lids and legs. The urine was loaded with *albumen*, and contained hyaline and granular casts. Subcutaneous injections of pilocarpine did not seem to arrest the progress of the disease. Premature labor was induced about the eighth month of pregnancy. The child lived. The hitherto extremely poor vision slowly improved, so that some nine months afterward it was $\frac{1}{3} \frac{4}{0}$ and $\frac{1}{1} \frac{4}{5}$. The retinal detachment was greatest in the right eye, in which it was quite general, but the replacement seemed at last to be perfect. The widespread pigment changes produced defects of vision, but the fields are reported as normal in extent. The white

spots of the macular region disappeared. S. Weir Mitchell ¹¹⁹⁸_{Sept. 20} had a case of *aneurism* of an anomalous artery causing antero-posterior division of the optic chiasm which produced bitemporal hemianopsia. There were, previous to the sudden death, no changes in the fundus and no mental disturbance. Hirschberg ¹⁹⁰_{Oct.} communicates a case of *arterial stenosis* of the retinal arteria temporalis inferior resulting in subjective sensations of light, obscuration of objects, headache, etc. Turning the eye inward, he practiced active massage of the globe upon the temporal side until pain, tears, etc., forced him to stop. The symptoms at once disappeared and vision became normal.

Schmall ²⁰⁴_{Ed. 34, H. 1} studies the ocular changes in *circulatory diseases*.

The most interesting part of the article is that pertaining to the retinal circulation in chronic anaemia. Ninety-four cases were examined, of which fifty-five were cases of chlorosis, thirty-eight of severe loss of blood, fevers, malignant neoplasms, etc. The conclusions reached are these:—

1. The retinal vessels often show a surprising fullness, not distinguishable from the normal. In 20 per cent. of chlorotic cases this was the case.

2. In 80 per cent. changes had taken place. In the greater number arteries and veins were equally affected, while in the minority of cases they were unequally affected. In chlorotic cases 30 per cent. were unequally affected.

3. The equal changes consist either in a weaker coloration of the arteries and veins (of infrequent occurrence and happening in pernicious anemia), or in a diminution of the calibre alone, occurring in neoplasms; or in both of these conditions united, occurring after exhausting diseases, in severe chlorosis, etc.

4. Abnormal differences of color between veins and arteries very seldom exist. Difference of calibre is the rule, the veins being increased twice or thrice the size of the arteries. Excessively bright veins were observed but once in chlorosis.

5. Increase of the calibre of veins was noted both in normal and narrowed arteries, but more frequently in normally colored than in abnormally bright arterial blood. Tortuosity of the veins is only very moderate.

6. Tortuosity of the arteries was frequently observed, but without any recognizable connection with the calibre.

7. The changes in fullness and color of the retinal arteries do not contradict the conclusions derived from the appearance and the disorders of the patient's general system.

8. Unilateral increase of the calibre of the veins sometimes exists, and is probably due to local causes.

9. Systematic classification of these cases, and making clear the elements of a precise prognosis, was impossible.

10. Arterial pulsation is frequent in the anæmic, and is recognizable by a movement of the artery and, in the more pronounced cases, by changes of calibre. It may at times disappear.

11. Increase or diminution of the arterial pulsation, caused by a sitting or lying posture, is seldom observed.

12. Compression of the carotid weakens the arterial pulse; compression of the jugular vein has no perceptible influence upon it.

13. Central arterial pressure is always diminished when arterial pulsation exists, and probably the intraocular tension is less also at the same time.

14. There is frequently a rapid decrease of the radial pulse, especially if the arm be raised.

15. Pulsation is more noticeable in tortuous arteries, but the pulsation itself has no causal relation with the tortuosity.

16. The arterial pulsation is independent of the fact of a diminution of the formed elements of the blood.

17. The arterial pulsation does not always disappear with the disappearance of the anæmia.

In opposition to Schmall's deductions, Friedrichson²⁰⁴_{BL,34,II,3} publishes the results of his own independent researches upon the same subject. As a basis of calculation he found the number of blood-corpuscles in twenty healthy men and twenty-eight women to average five million and seventy-two thousand and four million and nine hundred and three thousand per cubic millimetre respectively. The hæmoglobin and diameter of the corpuscles was also measured. In brief, Schmall finds in eleven cases of *anæmia* after hæmorrhage and fifteen cases of chlorosis that the hæmoglobin does *not* stand in any relation with the number of the red corpuscles. In the chlorotic, tortuosity of the arteries (veins, also, frequently) was often found. Arterial pulsation was constant in the form of locomotion. Transparency of the arterial vessels is coincident with that of the veins and preserves a certain relation with the quantity of the

hæmoglobin. The relative number of the corpuscles is in a few cases lessened; in the majority of cases there exists a slight aglobulia, and in some the relative number of the corpuscles is normal. The size of corpuscles is usually less.

Bull, of Christiana, ²⁴⁹_{June} describes an interesting case of unilateral tonic spasm of the ciliary muscle induced by *pressure on the carotids*. The phenomenon came on during somewhat forcible massage of the neck (for another ailment). Things appeared larger and suffused in a reddish or yellowish red color. Punctum remotum was eight inches. Temperature was higher on this side of the head. The pupil acted, showing a difference of origin of the nerves of the ciliary muscle and iris. The pupil responded at once to atropine, but it required prolonged instillation to reduce the spasm of the ciliary muscle.

Two cases of hæmorrhagic iritis occurring in *scorbutus* are reported from the St. Petersburg Augenheilanstalt, ²¹_{Oct. 22} in one of which there was also hæmorrhagic retinitis.

Priestly Smith ⁴²³_{July} describes a case of *intraorbital hæmorrhage* and other complications, the result of a trivial surgical operation, that jeopardized the life of the patient for some days. There was no history of hæmophilia in the family. The case of Gessner, ²⁵¹_{Oct. 19, 1881} of amaurosis and optic neuritis after loss of blood, may be compared with that of Zeigler, described in the ANNUAL of last year. In Gessner's case there was, in addition to the visual defect, an acute ascending myelitis. The hæmorrhage occurred after the delivery of her second child, born some twenty-four days before the patient came to the clinic. The loss of vision began coming on three days previously, *i.e.*, twenty-one days after the hæmorrhage, and in the three intervening days had progressed to absolute blindness. There was great *anæmia*, mydriasis, and optic neuritis. The retinal arteries were but little narrowed, the veins were not noticeably blocked, and there were no hæmorrhages. Paresis of both legs followed during the day, with loss of sensibility, and the next day rectal and vesical paralysis ensued. Six days later the paralysis extended to the upper trunk muscles and extremities, accompanied by severe pains in the arms. A week later the temperature fell to 36° C. (96 $\frac{8}{10}$ ° F.), and death from respiratory paralysis followed. Blindness continued complete throughout. Gessner reviews the theories advanced to explain the cause of the visual loss, and con-

cludes that the long, severe anæmia brought on general disturbances of nutrition, resulting in changes in the vessel-walls, whence resulted exudation of the blood and regressive changes in the organs. A. Jacobi⁵⁹_{July} reports a case of now febrile *purulent effusion of the knee-joint*, in an infant, following the subsidence of an ophthalmia-blenorrhœa. Chibret⁷⁸_{Jan.} had a patient operated upon for cataract, who fared well until the eighth day, when suppurative iritis set in and grew worse until an *abscess* that had formed *upon the right foot* was opened. The author concludes that we must recognize secondary infection through "mediate contact."

Our corresponding editor, Dr. Landolt, writes that Til-laux²¹²_{p.441,'87} saw a case of enormous *exophthalmos* due to a phlebitis localized in the ophthalmic vein and consecutive to a furuncle of the partition of the nasal fossæ. The eye was lost. Panas²⁷⁴_{Mar.} had a case of spontaneous hæmatoma of the orbit in an infant of four years, which was suffering with dyspepsia, diarrhœa, and epistaxis. The author thinks this a reflex hæmorrhage due to vaso-paralytic congestion from gastric irritation. Wagenmann²⁰⁴_{Bd.34,H.2} had a case of hæmorrhagic retinitis following extensive *burning of the skin* of the side of the face, arm, etc. The author explains the occurrence as due to changes in the blood that induced secondary inflammatory conditions in the eyes and other organs. The influence of *general disturbances of nutrition* upon the eye is shown by a case¹⁹⁰_{Dec.'87} of cataract coincident with teleangiectasis of the capillaries of the whole face, reported by Nieden. De Schweinitz³⁴⁷_{Apr.} had a case of *leucæmic retinitis* with hæmorrhages, yellowish discoloration, etc. The proportion of white to red corpuscles was as one to four. Vision was $\frac{2}{5}$ and $\frac{2}{10}$. Griffith²_{June} reports a case of optic neuritis associated with *chlorosis*. Under iron, aloes, and nux there was continuous improvement. Rahlmann⁶⁹_{No.25} emphasizes the importance of the ophthalmoscopic examination of the retinal vessels as indicative of the *atheromatous conditions of the cerebral vessels*. The report is based upon the examination of thirty-five cases, showing atheroma of the arteries of the body. He finds that in atheroma the retinal arteries show a sort of strangulation or constriction, caused by a diminution of their lumen. Above and below such points of stenosis are found more or less extended streakings, whilst in the lateral portions the vessel-wall is normal. Sometimes extravasations may be found without neuritis, however;

and, were it not that the antecedents, the history of the disease, and the absence of any scotomata in the visual field negatived the hypothesis, these appearances would lead one to suspect an embolism. At the same time, whether from distinct lesion or not, the veins show analogous strangulation or sacciform dilatations that, according to his observation, the arteries never show.

A case of *tobacco amblyopia* from cigarette smoking, occurring in a lad aged thirteen years, was treated ¹²_{AUG.} by Bruns. Vision fell to less than one-half. No mention is made of perimetric observations. Recovery with perfectly normal vision occurred within fifteen days after the use of tobacco was abandoned. The only treatment that he received was one hypodermic injection of one-tenth grain of strychnia; this he does not consider to have had anything to do with the cure.

From an analysis of forty-nine cases and careful study of the literature of the subject, Browne¹⁸⁷_{JAN.} gives these propositions:—

1. The optic nerve resembles a sensory tract of the spinal cord, consists of two tracts, of which the central has a special affinity for tobacco, while other drugs, *e.g.*, quinine, will leave it unaffected.

2. Tobacco is the essential agent in causing an axial neuritis, which does not in ordinary cases tend to spread to the nerve-fibres coming from the peripheral retina.

3. As a rule patients apply in the early stage of neuritis, and complete recovery may be expected without any treatment except entire cessation of smoking.

4. When recovery is established, moderate smoking is not injurious.

5. Although it would be absurd to suppose tobacco is the only agent capable of causing axial neuritis, no other has yet been substantiated in a series of cases arising in strictly non-smokers.

6. Besides tobacco, a special condition is required to precipitate an attack; alcohol, diabetes, excessive venery, starvation, mental shock, or distress are the most common auxiliaries.

7. In some persons a special tendency to degeneration (sclerosis or atrophy) exists hereditarily; to these tobacco is especially injurious.

Baker²²²_{JUNE} summarizes his conclusions in reference to tobacco amblyopia, as follows:—

1. There is a toxic amblyopia due to the excessive use of tobacco.

2. That the excessive use of alcohol or other toxic agents does not produce the same or a similar amblyopic condition, although by their depressing influence on the vital functions they may serve as predisposing causes.

3. Tobacco amblyopia does not usually lead to total blindness. The disease is essentially a functional one. Gross pathological changes have not been demonstrated, either in the retina, optic nerve, or cerebral centres.

4. The course of the disease may result in a certain amount of failure of sight and then remain stationary, even though the tobacco habit be not entirely given up.

5. Stopping the use of tobacco will result in recovery of sight without the use of specific medication, although the use of strychnia and tonics, by increasing the general tone of the system, may hasten the cure. The moral effect of taking something to replace the loss of the tobacco is of great value.

II. St. Clair Buxton,^{6 Feb. 29} details a case of a male aged fifty-one years, whom he supposed to be suffering from tobacco amblyopia, the case having been diagnosed one year previously by reason of the appearance of "a few small white specks near the macula in the right eye," as albuminuric retinitis. The description of the fundus is in no way typical. Neither is there any mention of a study of the field of vision or examination of the urine by the microscope. The treatment consisted in the cessation of tobacco, with the use of alteratives, iron, and nux vomica. At the end of four weeks sight had increased from light perception to $\frac{6}{12}$.

S. C. Ayres,^{53 Jan. 21} reports three cases of *alcohol and tobacco amaurosis*.

Doyne,^{423 Jan.} adds a second case of monocular central amblyopia to that of Hutchinson, Jr., which seems to him to be unequivocal and of interest. The patient, a man of thirty-eight years, who was addicted to the excessive use of tobacco, and in whom no history of excessive illness, nervous shock, alcoholism, or syphilis could be obtained, came to him with the vision of the right eye reduced to $\frac{6}{36}$, whilst that of its fellow was normal. There were "typical central scotomata for red and green" in the affected eye. The right disk appeared possibly congested. In five months' time

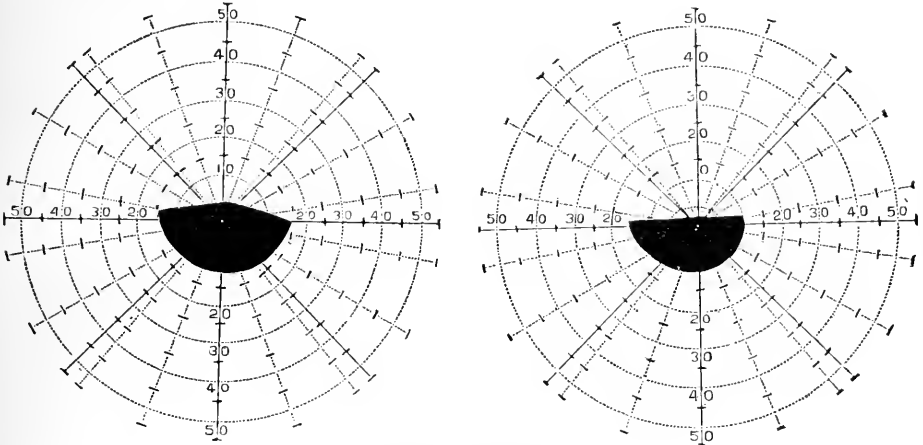
central color perception had returned and vision had increased to $\frac{6}{5}$. No other treatment than the discontinuance of the use of tobacco with the administration of strychnine had been ordered. He deduces the conclusion that there is a probable toxic influence of tobacco, "and perhaps other agents," upon a substance analogous to the visual purple resident in the human retina, thereby degenerating it, and causing retinal exhaustion, which shows itself in the failure of the more delicate color sense in the situation of the greatest retinal activity. In connection with Agnew, Webster¹_{Sept 5, '88} has seen a case of *tobacco amblyopia*. No record of the fields of vision is made. Discontinuance of "the weed" caused rapid disappearance of the trouble. Absolute central scotomata with impaired peripheral vision following injury of the head is noted by A. D. Williams,¹⁶⁹_{June} of St. Louis. Gifford³⁴⁷_{Mar.} reports a case of *atypical alcoholic neuritis* in a fifty-eight-year-old male, who for six years had used alcohol and tobacco to excess. Both Fernandez and Madan give accounts of cases of *alcoholic amblyopia*, in which there were definite changes in the optic nerve. (Report of Dr. Fernandez, corresponding editor, Havana.)

Lopez¹⁷³_{Feb., '88} reports a case of *quinine amblyopia* resulting from the taking of twenty grammes (55) of the sulphate in twenty-four hours. The fields are shown in the annexed cuts. They were both contracted to not over twenty degrees. The amblyopia lasted for more than ten days.

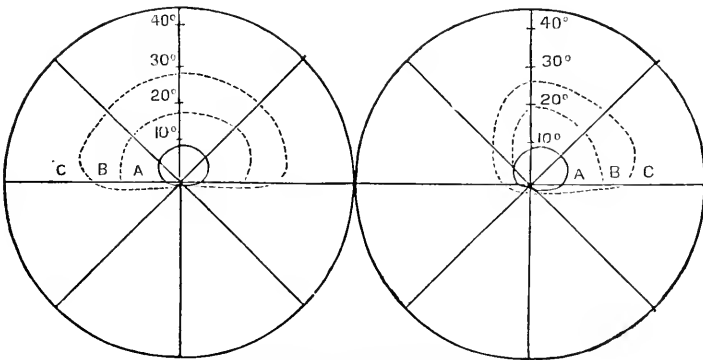
Three cases of *hemianopsia*, with other curious visual-field faults, the probable results of chiasm lesion, are given in detail by Seguin.²⁴²_{Nov., Dec., '87} In all the Wernicke sign was present. An elaborate discussion of the subject, followed by a series of diagnostic propositions or laws applicable to all cases presenting the inaction sign, is given. Mooren,⁴⁶² in his short sketch on "Eye Troubles in their Relation to Occipital Disease," says: "I will only observe that hemianopsia depending on occipital-lobe affections is never complicated with mydriasis or capillary apoplexy at the entrance of the optic nerve, as we find in *truncus* disease; on the contrary, corresponding to the integrity of the anterior part of the corpora quadrigemina, the pupillary movements are always intact, but the hemianopic restriction of the field of vision exists in the one case without any further complication, in other cases it is combined with reduction of the acuteness of vision, now with absent color percep-

tion, then, again, with hemianopic color-defect. He cites several rare clinical observations.

Nothmangel⁶⁵⁰_{May 17} gives an instance of probable *superior hemianopsia* with color derangement in the remaining fields following sudden blindness a few weeks previously. The right iris was not so responsive as its fellow. Pupils varied in size. No mention is



LOPEZ: QUININE AMBLYOPIA.
(*Recueil d'Ophthalmologie.*)



BADAL: INFERIOR HEMIANOPSIA.
(*Archives d'Ophthalmologie.*)

made of the Wernicke sign. He considers his case another illustration of Munk's hypothesis, and places the lesion in the cortex of the occipital lobes.

Badal's case of inferior hemianopsia is of interest. We here give cuts of the visual fields. (See Dr. Seguin's department, A, vol. ii, for full description.)

Putzel's case⁵⁹_{June 2} of *right hemianopsia* with normal pupillary reaction, in which, upon post-mortem, the left cuneus was found occupied by a cyst, is of great clinico-pathological interest and importance, in support of the theory that the cuneus is the cortical centre of sight. It is curiously noted, however, in the history that the blind half of the field of vision passed *through* the point of fixation.

Hinde⁵⁹_{Dec 17, '87} adds a case of the gradual formation of right homonymous hemianopsia in two months' time, the patient having been struck on the left temple by a bottle two years previously.

Landolt (corresponding editor), has kindly forwarded us a note upon "two observations of verbal blindness, one with relative right hemiopia, the other with absolute right hemiopia," these forming part of his contribution, entitled, "*De la Cécité Verbale*," to the work dedicated to Donders on the jubilee occasion at Utrecht, on May 27th, 1888. He also gives a note of an observation by Porac, of "verbal blindness with left hemiopia and left hemiplegia in a right-handed person," and says that "the last case is all the more worthy of attention, as the hemiopic half of the retina had retained the faculty of perceiving white, but not of perceiving colors."

Bouveret's case¹¹_{Nov. 4, '87} of blindness with moderate pupillary dilatation and want of any pronounced ophthalmoscopic signs, in which upon post-mortem examination there were cortical and subcortical changes in temporal and occipital convolutions, seems to still further confirm Munk's theory that there is a centre of communication between the retinae situated on the internal face of the occipital lobe.

By studies in several cases of absolute *hemianopsia*, Oliver⁹_{Mar. 13} has determined that the hemiopic pupillary reaction sign of Wernicke is more pronounced in the eye giving the lesser amount of color saturation, although the peripheral areas of its remaining fields may be much smaller than those of the opposite eye: this he thinks is another determining sign to the all-important question of cerebral localization, as it distinctly shows which eye has the greater amount of destructive or irritative lesion.

Mackay²_{Nov. 10} believes that "there is not yet any well-constituted case where a hypothetical half-vision color centre had suffered alone and other senses have been left 'intact,' and feels confident that cases of partial hemianopsia are far more frequent than is usually supposed, and not less certain that their more careful investigation

is calculated to throw much light on the nature, relations, and localization of the visual senses."

Audry²¹¹_{Aug. 12} gives a clinical example of a patient who could not see distinctly enough to read, and in whom there was no diplopia, no scotomata; and the movements of the eyes and eyelids were normal. Ophthalmic examination showed a normal fundus. Occipital headache, tinnitus, inability to stand, loss of facial expression, and difficulty of answering questions came on. The patient became comatose, pupils dilated and became insensible to light, death ensuing in one week. Post-mortem showed two large symmetrical clots of blood under the dura, covering the occipital lobe, chiefly on their external and lower surfaces, down to the cerebellum.

Chauffard's case⁹²_{Feb.} of sudden blindness with hæmorrhagic lesions in the two occipital lobes, together with the history of three other cases by Berger and Bouveret, are partially confirmatory of the belief of Starr, Seguin, Exner, and others, that the cortical centres for vision are in the occipital lobes. There was a probable hemianopsia with right hemiplegia, followed in two months' time by blindness and death. The autopsy, a few hours after the blindness, not only showed the sequelæ of two old clots in the left hemisphere, and one in the lobule of the insula in the neighborhood of the external capsule, and the other close to the pulvinar at the point where the fasciculi of the optic tract pass to the first occipital convolution, but gave evidence of a large fresh extravasation in the right hemisphere, extending from a point of the second occipital gyrus to the substance of the brain, beneath the second and third occipital gyri and the posterior portion of the third temporal convolution. (Cuts of these conditions are given in Dr. Seguin's department, A, vol. ii.) Of interest to ophthalmologists are the facts that the eye-grounds were normal, pupils equally and moderately dilated, the irides responsive to light stimulus, and that the blindness was sudden and total.

Verrey²⁷⁴_{July, Aug.} has been able, by careful clinical study, followed by post-mortem examination, to furnish an example of the cerebral condition productive of loss of color vision alone. The patient, a female of sixty years, complained of fatigue during near vision, which existed since an attack which she supposed was gastric in character, but which by careful questioning proved to have been one of cerebral apoplexy, from which she had quickly recovered.

Ophthalmoscopic examination failed to reveal any abnormal condition, whilst both intraocular and extraocular muscle action appeared normal. Correcting glasses were ordered, but the symptoms still continued. Testing the visual field for colors showed a mere diminution of form and light perception in the portions of the field where colors were not recognized. In the probable absence of dyslexia and word blindness, he concludes that the diminution in form and light perception would account for the difficulty during near work, and gives the expression "cerebral asthenopia" in answer. With the exception of several minor attacks of cerebral disturbance, the patient enjoyed fair health for almost two years, when she had a sudden left hemiplegia, general anaesthesia, violent vomiting, with both tonic and clonic spasms of the face and the right side of the body, which lasted about one day, followed by increase of coma and stertorous breathing. The patient died in one week's time. The autopsy, which was made a few hours later, in conjunction with Dr. Burkhardt, showed two points of hæmorrhage, one in the posterior extremity of the median surface of the left occipital lobe, and the other showing itself by a longitudinal section through the corpus callosum. Independent of these two lesions, the hemispheres appeared perfectly normal. Further examination showed that there was a large, fresh hæmorrhage in the corpus callosum which extended into the right centrum ovale and penetrated into the right lateral ventricle. (For accurate description of these lesions, etc., see plates and description in Dr. Seguin's department.)

For full description of Hauer's case⁸⁸_{Nov.7} of hemianopsia as one of the symptoms from extensive lesions of the pia and dura maters; Freud's⁸¹_{Aug.11} most interesting cases; Hauer's other cases⁸⁸_{Oct.31}; Sachs' beautiful instance of so-called tetranopsia,⁸_{Aug.20} of which variety one of the editors has had an opportunity of studying; Treitel's and Baumgarten's case of unilateral temporal hemianopsia²⁰_{Feb.2} with autopsy; Veronese's case⁸_{Sept.13} of sudden blindness with normal eye ground, and other instances, the reader is referred to Dr. Seguin's department.

The hemiopic pupillary inaction sign of Seguin²¹²_{Nov., Dec. '87} (Wernicke's hemiopic pupillary reaction sign) is so important that we give the following partial explanation:—

"If, in the hemiopic eye, we throw the pencil of light (concen-

trated from a lamp by an ophthalmoscopic mirror) directly into the eye in its optical axis, we obtain a full and quick pupillary reaction. If, now, we move the mirror more and more nasalward from the optical axis, and throw the beam of light through the pupil upon the normal (temporal) half of the retina, a good reaction occurs until the light ceases to enter the pupil. If we next move the mirror outward or temporalward from the optical axis of the eye, we obtain pupillary reaction over quite an arc of the circle; but after passing a point between sixty or forty degrees from the horizontal pupil line, pupillary reaction no longer takes place, and we have a demonstration of hemiopic pupillary inaction."

Both sensory and motor disturbances of the ocular apparatus of destructive and irritative types have been described in detail by Oliver⁵_{Oct.} in a case of neoplasm involving the left cortex and subcortical tissue with probable basilar disease. (For full description consult Dr. Semm's department.)

From an observation of combined transitory blindness with blepharospasm in a case of ulcerous cornea, Silex³⁵³_{Mar.} believes that the amaurosis was due to a probable cortical blindness, whereas Samelsohn³⁵³_{June} asserts that the blindness was purely reflex, and similar to the spasmodic action of the lids.

Gessner²⁵⁴_{July} has observed a case of acute persistent amaurosis with probable ascending myelitis, following profuse hæmorrhage after child-birth, the patient having had great loss of blood at the first (the previous) labor.

Charcot's study¹⁷³_{Nov., '97} of *ocular symptoms in "Sclerose en Plaques"* and ataxy are extremely useful to ophthalmologists, and should be carefully studied. His statement that nystagmus is rarely met with in Friedreich's disease can hardly be borne out. He cites several instances of intraocular lesions occurring at La Salpêtrière in various neuroses.

In the examination of a number of tabetics, Berger⁴⁷⁹_{June} has found diminution of the intraocular tension, paresis of the lid muscles (smooth fibres), and pupillary deformities which were generally symmetrical.

In an analysis of one hundred and forty-three cases of *Friedreich's ataxia*, Griffith⁵_{Nov., '97} says that strabismus is reported in eight cases, but many may have been accidental; diplopia and blepharospasm are referred to but in a few instances; partial atrophy of the

optic nerves was seen but twice, and the pupillary reflexes were always present. He further asserts that "a characteristic symptom is nystagmus, which appeared in fifty-six instances, and would have doubtless been seen later in many others." The form is almost always that of an ataxic nystagmus. Vision was impaired in a number of cases in which no ophthalmoscopic examination was made. Joffroy¹⁷³_{sept.} reports a case of *Friedrich's disease* with curious and anomalous eye symptoms.

Grandclément⁷⁸_{June} has met a singular case of *monocular hemeralopia* in his practice, occurring in an apparently healthy man of twenty-six years of age, who, eighteen months previous, accidentally noticed an inability to guide himself at night by the use of the right eye alone. Four patches of pigmentary degeneration near the ora serrata were the only lesions found in the retina. Perimetric observation showed a small area or absolute want of color perception, with a peculiar blindness for yellow, which was termed white over the entire color field. In explanation, he offers the probability of traumatic hepatitis with jaundice, dating from an accident four years previously. He then, however, pertinently asks, Why were not both eyes affected? In addition, there was a painful spasm of the fibres of the orbicularis of the same eye. A vain attempt to relieve this spasm by the hypodermic injection of antipyrine caused a remarkable improvement in the hemeralopic condition, which after a few repetitions of the method entirely ceased.

Two new cases of *erythropsia* have been brought to our notice by Valude,²⁷¹_{Mar., Apr.} one of which was subsequent to a cataract extraction. He is of opinion that exposure of a weakened organ to dazzling light debars it from receiving and transmitting any but the least refrangent rays of color. Especially is this the case among the weak and anæmic, and where the pupillary area is large.

Three cases of *hysterical blindness* in the male are reported by Moore.⁵⁶¹_{Aug. 2} Case I. Unioocular type, that of a farmer aged twenty-five. Vision in the left eye equalled O. Fundus was normal, with the exception of a slight patch of opaque nerve-fibres near the disk. Testing with prisms and light gave diplopia, as did deviation of visual line by extra ocular pressure. Faradism severely applied was followed by immediate improvement. Case II. Student and farmer, aged twenty-two years, with neuropathic history. For

eighteen months patient imagined he was going blind, dating from atropine instillation for refraction estimation. He wore dark glasses, and later a bandage, remaining in a dark room for two months. The eyelids were kept closed, but not upon account of spasm. Corneæ clear; V.=O; examination under ether showed no abnormality in eye-ground. Canthoplasty was made, and in two days the patient walked about without glasses and has remained well since. Case III. A fifteen-year-old lad with blindness in the right eye, which occurred after disappointment at school. Under ether and electricity recovery was rapid and permanent.

A case of simulated or hysterical blindness occurring in a young married woman and persisting for several months is recorded¹⁰⁹_{July} by A. D. Williams. Cure was suddenly effected by raising the cry of fire. Her careful avoidance of impediments placed in the usual way of egress gave abundant evidence of recovery.

Thorburn⁹⁰_{Dec.} has examined the field of vision in two cases of what he terms "*traumatic hysteria*," and in both he found a very great difference in area between the two sides, that of the right eye in each instance being much the larger.

The following conclusions by Oliver¹¹³⁹_{Nov. '87} are based upon the examination of the eyes of twenty young adult male *imbeciles* seen at the State Hospital for the Insane at Norristown, Pa.

First, the present study tends to show that the adult eye of the imbecile is an organ which is capable of proper functional activity, and that the want of action is, in the main, due to what may be termed intellectual hebetude.

Second, by reason of mental incapacity, which has supervened in such subjects before the eye has been brought into continued and constant action as an instrument of accurate and delicate use, the ordinary appearances seen in the used eyes of the mentally healthy in due proportion to the amount of work given to the organ.

Third, the want of these physical changes, presenting a picture almost identical to the one seen during infantile existence, may be considered as typical of an unused, healthy, adult human eye.

A case of optic atrophy following *chorea* in a boy seven years of age is reported by William George Syms,³⁶_{Mar.} who, however, did not see the case until ten years after the occurrence of the attack. There was no history of syphilis, traumatism, or rheumatism. The boy while recovering from an attack of chorea "felt a sudden mist

come over the right eye," and from that time was not able to see with it. Upon examination, vision of the left eye was normal, whilst that of the right eye was *nil*. Ophthalmoscopic examination of the affected eye showed absolute atrophy of the optic nerve, with marked decrease in the size of the vessels. Macular region and choroid appeared normal. He considered the case due to an embolus of the central retinal artery. In a very careful examination of the eyes of fifty cases of chorea of childhood, de Schweinitz^{1 June 25} deems the following conclusions justifiable:—

"1. The irides of choreic children quite commonly present chromatic asymmetry in shade, just as the same condition has been found in other forms of nervous disorders.

"2. Slight difference in the width of the pupils may be observed, but not more frequently—in fact, not as frequently—as these have been noted in perfectly healthy individuals.

"3. Facial asymmetry is present in about one-half of the cases, just as this is present in cases of high refractive error, and also in individuals perfectly free from nervous disorders.

"4. Hypermetropia and hypermetropic astigmatism are vastly the preponderating conditions of refraction in the eyes of choreic children, being found in about 77 per cent. of the cases, exactly as hypermetropic refraction is the preponderating condition in childhood generally, being found in 76 per cent. of the eyes of children in the elementary school years.

"5. Imperfect equipoise of the eye muscles is found in the great majority of the cases, but imperfect equipoise of the eye muscles is very frequently present in the eyes of school-children free from chorea or neuropathic tendencies.

"6. Embolism, atrophy of the disk, and optic neuritis may occur during or after attacks of chorea, but appearances in the fundus oculi characteristic of the disease have not been found.

"7. As Octavius Sturges remarks: 'It seems certain that a fairly constant proportion of chorea is directly connected with what may be called injudicious schooling, . . . but such nice adjustment as shall prevent overstrain on the one hand and overindulgence on the other is practically unattainable.' Certainly an endeavor to lessen the overstrain of the eyes should be made. Hence, the refraction errors and muscular defects in these children should be carefully and fully corrected by glasses, by prisms when necessary,

or even by judicious surgical interference, and thus a probable exciting element removed; just as we should perform the same service for eyes similarly afflicted in children who are not choreic; just as we should improve the hygiene, remove the anæmia, treat the disabled circulatory apparatus in children who are choreic. Evidence, however, seems quite as lacking that hypermetropic refraction is the basal cause of chorea as it is that the chorea is the cause of the hypermetropia."

Baruch and Peck⁵⁹_{Nov. 19} give the history of an interesting case of a male epileptic with amblyopia, diplopia, and hemianæsthesia, the symptoms rapidly disappearing by remedies directed toward the nervous system.

In another case⁵_{Nov.} of long-standing epilepsy of uncertain origin, which was successfully operated on by Keen, in which the attacks began in the left hand, ophthalmoscopic examination by Oliver gave negative evidence as to the probable situation of the irritation focus, but plainly showed the characteristic changes in the eye-ground usually seen in epileptic subjects with frequent seizures—a low and chronic form of retinitis, associated with dirty red-gray appearance of the optic nerve, more marked on the right side, the corresponding visual field being somewhat smaller.

Kuies³_{June 13} says that if the eye-ground of the epileptic be examined carefully, we perceive venous hyperæmia, retinal disturbance, and optic-nerve degeneration (*vide* last year's ANNUAL, vol. iv, p. 156), which conditions may be of value in the differential diagnosis between true and simulated epilepsy. He has been so fortunate as to examine the fundus during a seizure, and found contraction of the arteries and dilatation of the veins.

Gönc⁷²⁵_{July, Aug.} gives the description of the development of an intra-ocular tumor in the neighborhood of the optic disk, the other eye having a similar mass commencing upon the border of the nerve. These conditions the author attributes to the abuse of tobacco (!?). (Maklakoff.)

SECTION V.

MATERIA MEDICA AND INSTRUMENTS.

Power⁴⁶² calls attention to the bearing of late studies of *microbes* upon the *therapeutics of ocular disease*. Particular reference is made to the greater prevalence of aerial microbes in hot months

of the year, in crowded places, and at low elevations, and the consequent duty of segregation of patients with trachoma and other infectious diseases, of abolishing underground dwellings, of keeping patients in the open air, at sea-shore, or in upper rooms, of cleanliness, etc. From a study of eighteen cases of *atropine irritation* Collins⁴²³_{July} found that the phenomenon tends to occur more frequently in old people, and shows no law as to the parts of the eyes and face affected. That the phenomenon is due to imperfections in the solution is not believed. By rubbing the forearms of the patients who got the atropine irritation with atropine ointment, he proved that the irritation was not purely a local phenomenon. If the checking of the natural secretion, which is the physiological effect of atropine, is the cause of the irritation, or if it be due to microbes acting more powerfully in the dry conjunctiva, the question yet remains, why the idiosyncrasy? Out of the eighteen cases the author found that all but six had a history of gout or rheumatism, hereditary or acquired. Williams¹⁰⁹_{Aug.} describes an erysipelatous inflammation and swelling of the skin resulting from the use of atropine. There was at one time a dropsical effusion of the skin of the whole body, accompanied by redness and itching. The symptoms passed off with discontinuance of the atropine. Samelsohn¹¹⁶_{v.2, No.3} says that the more extended and superficial the vascularization in keratitis, the more noxious is atropine. He thinks, generally, that it is entirely too freely used in ophthalmic practice. Wicherkiewicz⁷⁸_{July} instilled a drop of solution of atropine in the eye of a man of sixty-six, and, although following it almost immediately by eserine, there was the next day a sharp attack of acute glaucoma. With eserine and morphine the symptoms disappeared in three days. Drake-Brockman²⁰⁶_{Nov. '97} reports five cases of hypertension of the eyeball induced by atropine instillations. Gelpke⁴⁹_{Mar.29} enters upon an extensive polemic against the abuse of atropine. Its usefulness in iritic affections and in deep and extensive corneal inflammations is admitted to be necessary, but in injuries it is not always so, and for examination rarely so. For diseases of the adnexa oculi, in acute and chronic conjunctivitis, foreign bodies in the conjunctival sac, or in the cornea, acute superficial keratitis, marginal ulcers of the conjunctiva, and in glaucoma, its use is condemned.

Jourevitsch¹¹⁴⁰ finds experimentally that *cocaine* increases and

favors the absorption of other drugs, concerning which our corresponding editor, Dr. Maklakoff, notes that he had himself called this drug the "multiplier of atropine and eserine." As to cocaine, Wicherkiewicz²⁸³_{Nov.} thinks that the corneal opacity that has occasionally been noticed is due to too strong solutions or too liberal use of the drug. He drops a 3 to 5 per cent. solution in the eye twice shortly before the operation. Herrnheiser¹⁶⁹_{June} finds that subcutaneous injections of a 10 per cent. solution give local anæsthesia sufficient to perform operations, even enucleations. Ayres²⁴⁹_{Sept.} had a patient who had used a 5 per cent. solution of cocaine several times daily for over a year. Paralysis of the sensory nerves of the conjunctiva and cornea did not disappear for the six weeks the patient was under treatment. The conjunctiva was thickly studded with granulations, thickened and transparent. The lachrymal canals were closed (with consequent lachrymation) by the swelling of their lumina, and the puncta protruded. Abadie¹⁷³_{Oct.} describes the death of a patient following the injection of three-fourths syringeful of a 5 per cent. solution of cocaine for an operation upon an eyelid. There was a loss of consciousness within five to ten minutes, the respiration stopped, the face cyanosed as if from asphyxia. There was a partial resuscitation after great efforts, but death was unavoidable and followed the same evening. Whether due to an apoplexy or to the cocaine was not determined.

Stewart⁹_{Mar.3} concludes, from his study of the clinical value of *homatropine hydrobromate* in ophthalmology, that single instillations of less than one-fifteenth grain are valueless for estimating ametropia, that the drug is useful for ophthalmoscopic examination, but that repeated instillations are irritating, not only to the conjunctiva but to the deeper tunics of the eye, and hence should be avoided in correction of refractive error. De Schweinitz and Hare,⁹_{Dec.24, '87} after experimental studies of the physiological action of homatropine, conclude that Tweedy and Ringer were right in their statement that homatropine acted upon the heart in much the same manner as atropia itself, although to a weaker degree. Dabney⁵⁹_{Sept.15} thinks that homatropine is not to be relied on for complete paralysis of the ciliary muscle, and cites several cases in which the accommodation was only overcome by atropine.

Many articles concerning the value of the African Haya

poison, or *erythrophleine*, an alkaloid derived from the bark of *Erythrophloeum Guineense*, as an anæsthetic in ophthalmic practice, have appeared since Lewin⁴¹_{No.6} gave the results of his experiments with the drug. He found that a solution of 0.2 per cent. (even a 0.1 or a 0.05 per cent.) of the hydrochlorate produced, in fifteen to twenty minutes, a complete anæsthesia of the eyes of animals that lasted from one to two and a half days. A stronger solution produced severe symptoms of irritation and even corneal opacities. Koller⁸⁴_{No.6} has studied the action of the drug, and finds that two drops of a 0.25 per cent. solution produced in a dog's eye, within a minute, evident painful sensation that increased for twenty minutes to blepharospasm, injection of the conjunctiva, etc. The irritation symptoms subsided in half an hour. There was complete anæsthesia of the cornea, lasting some hours. The next day the eye was closed, the conjunctiva red and swollen, and the cornea so cloudy that the iris is hardly visible. This cloudiness cleared up in a few days. He then put two drops of a 0.125 per cent. solution in his own eye and in one to two minutes felt a severe burning, followed at once by conjunctival injection and lachrymation. The pain increased and spread to the whole side of the face, the ear, and especially to the nose, gradually subsiding in thirty-five to forty minutes from the beginning of the experiment. The cornea was then without sensibility and remained so for several hours. The next morning it had not entirely regained its sensibility. There were no changes in the pupil or accommodation. The cornea became cloudy in one and a half hours, increasing until evening, and there were rainbow rings about lights. The corneal cloudiness passed off only after several days.

The net result of a vast number of experiments goes to confirm that the new drug is probably not destined to replace cocaine. Its action is too irritating, too prolonged, too dangerous to the cornea, and the anæsthesia often seems to be untrustworthy, and never more perfect than that of cocaine. According to our corresponding editor, Dr. Landolt, erythrophleine has been tried in several clinics by Troussseau,⁴¹⁴_{p.331} Panas,⁷³_{p.104} Landolt,⁷³_{p.295} and others. All consider it as a local anæsthetic far inferior to cocaine. The anæsthesia produced by it is not so complete as that produced by cocaine, and its application causes pain and even inflammatory symptoms. On the other hand, it does not influence

the non-striated muscles of the eye; the accommodation seems intact, and the accompanying myosis is probably but a reflex phenomenon.

Purtscher¹⁹⁰_{Mar.} praises *creolin* (fresh 1 per cent. solution) for conjunctivitis both of the simple and phlyctenular forms, and in acute cases of trachoma, in blennorrhœa of the lachrymal passages, and in ulcerative and hypopyon keratitis. Upon applying the solution there is considerable smarting for a time, which may be obviated by the use of cocaine. Kazaurov⁷⁸_{Oct.} tried the drug in fifty-nine cases. In eight cases of catarrhal conjunctivitis there was a favorable result in five, two doubtful, one bad. In trachoma, fifteen out of twenty-four cases was with good results, and in six no result. In eight cases of phlyctenular conjunctivitis the effect was good where the ulcer was elevated, but inefficacious in simple phlyctenulæ. In five cases of ulcers of the cornea the results were all favorable, and in parenchymatous keratitis, especially if vascular, creolin was highly useful. Mergl¹⁹⁰_{Aug.} while praising creolin for trachoma (recent cases) as highly as Purtscher, is not so enthusiastic in referring to other experiences. In chronic conjunctivitis the results were not good. Grünhut⁸⁸_{Sept.26} does not confirm these opinions as to trachoma, and in keratitis with iritic tendencies he also condemns it. In catarrhal conditions he prefers nitrate of silver. He allows it a subordinate rôle as an antiseptic and astringent, and speaks quite highly of it in blepharitis in a 1 per cent. vaseline ointment. Grossman²⁴_{Sept.2} in general is of much the same opinion as Purtscher. In phlyctenular conjunctivitis and papillary trachoma his results were very satisfactory, but in chronic blennorrhœa of the lachrymal sac no improvement was noted.

Darier, according to Dr. Landolt, has practiced hypodermic injections of *pilocarpine* (0.01 gramme to 0.02 pro dosi) on a large number of patients. He says that after a few minutes there is a marked improvement of the visual acuity, and sometimes a central scotoma for colors disappears. He also recommends the drug as modifying the exudative processes in the macula-changes of myopia, exudative retinitis, and choroiditis. Bock¹⁶⁹_{Mar.} had good results from injections of small amounts (2-3 centigrammes) of concentrated solutions of pilocarpine in cases of blood in the anterior chamber, and in vitreous opacities after iridocyclitis and choroiditis without

general disease. In rheumatic affections he does not use this, but milder diaphoretics. Staderini³⁰_{v.17, No.3} also uses it in inflammatory ocular affections (especially of rheumatic origin) accompanied by serous effusions. He also advises it in progressive myopia and in retinal detachment, and for absorption of opacities of the vitreous.

Grandclément²⁷⁴_{July} holds that "injections of *antipyrin* into the temple (0.25 at a time) are especially serviceable in relieving hemicrania, neuralgia of the lids, monocular hemeralopia, floating bodies in the vitreous, toxic amblyopia, episcleritis, and sclero-choroiditis, pain after detachment of the retina, and after cataract operations with entanglement of the iris." He further says, "We have had cases of keratitis, iritis, and irido-choroiditis that were speedily cured by three to four injections of antipyrin, and relieved of the violent ciliary pains accompanying them—this is the real triumph of antipyrin!" Ryerson¹⁴⁷_{Feb.} reports three cases of immediate relief of pain in acute inflammations of the eyes by the use of antipyrin in fifteen- to twenty- grain (1-1.32 grammes) doses twice or thrice repeated. One similar case is reported by Wetherby.⁵⁹_{Feb.18} Aldor¹¹⁶_{July} reports cases of the good influence of antipyrin in clearing up corneal opacities. It was with calomel dusted into the eyes. De Schweinitz and Atlee¹¹²_{Nov.} have found that the "head-pains" associated with eye affections in syphilitic subjects have been greatly relieved by the administration of *antipyrin*.

Nicolai,¹⁰⁷⁵ as reported by our corresponding editor, Dr. Rijnberk, concludes that the bacilli in *jequirity* infusion do not cause the conjunctivitis and have no influence on the development of the active element. The power of the seeds is due to a ferment that becomes inactive at high temperatures. According to our corresponding editor, Dr. Maklakoff, of Moscow, Russia, Logetschnikoff⁷²⁵_{July} has seen dacryocystitis and conjunctival cicatrices result from the use of *jequirity*, and finds herein its contra-indication. On the other hand, he finds it the best remedy in trachoma, using a 5 per cent. infusion of the hulled grains in cold water, which is ready in six hours. It must not be shaken or filtered, and only the supernatant water used.

Budin¹⁴_{May 23} thinks *naphthaline* was of great service in two cases of purulent ophthalmia in shortening the duration of suppuration. Valude's conclusions,¹⁷³_{Sept.} from a considerable experience with the drug in various forms of purulent ophthalmia, are "in

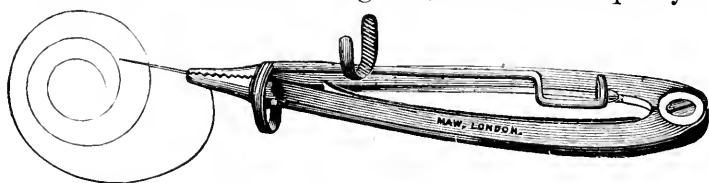
general very encouraging;" though not lessening the secretion greatly, it reduced at once the swelling and œdematous tissues and lids, and for this it is highly praised.

Mergl¹⁹⁰_{Aug.} has found that in ulceration of the cornea, especially where hypopyon exists, a 10 per cent. *iodoform* (vaseline) ointment is of great use. Fifty cases of hypopyon keratitis have been treated in this way with but two paracenteses.

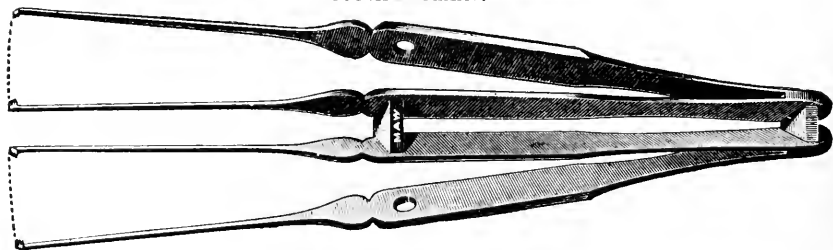
Alt³⁴⁷_{Nov.} finds that carbolic acid, iodoform, iodol, and boric acid are not satisfactory as *germicides* in the treatment of external diseases of the eye. Bichloride (1 : 2500 or 1 : 5000) is held to be preferable. He has found it good in simple, chronic catarrhal, and in all purulent forms of conjunctivitis, in trachoma and in blepharitis ciliaris. In acute catarrhal conjunctivitis it is less useful, whilst in the phlyctenular type it has a bad influence. In parenchymatous keratitis from inherited syphilis it seems to be without beneficial influence. Webster¹⁰¹_{Oct.} reports that at the Manhattan Eye and Ear Hospital they found the bichloride solutions used as antiseptics resulted in corneal opacities, and since last March Panas' solution has been used. This is composed of one part biniodide of mercury to four hundred parts of absolute alcohol and twenty thousand of water. Snell⁷⁶_{May} confirms Pagenstecher's conclusions²⁴⁹₁₈₈₁ as to the value of *massage* and as to the cases suitable for its employment in ocular therapeutics. The yellow oxide ointment, one grain up to one drachm (0.065–3.89 grammes), is almost invariably employed, but it is contended that the good results are largely due to the massage as well as to the drug itself. The lower lid is drawn down and a piece of ointment inserted; when it has liquefied and become diffused the lids are gently but quickly rubbed over the globe or even against each other. This plan is recommended for simple and chronic forms of conjunctivitis, catarrhal ophthalmia, indolent ulcers, and maculæ of the cornea, performed at first daily, later on alternate days. In cases of congestion and overdistention of the blood-vessels, Paddack⁴⁶² advises the use of *ergot*—a good preparation and in maximum doses. Conner⁴⁶² praises *hot water as a therapeutic agent* of great value in eye diseases. He advises the immersion of the eye in the hot water held in a tumbler. The water must be as hot as the patient can bear, *i.e.*, 105° to 140° F. (40.55° to 60° C.), and must be applied long and frequently.

Burckhardt¹⁹⁰_{May} has devised an instrument for everting the upper lid in the treatment of purulent conjunctivitis, claiming that by it the procedure is easier than by the ordinary methods.

Cousins⁶⁰_{June 16} adds two instruments to his armamentarium. First is a double fixation forceps, as in the subjoined cut. He claims that they have proved very satisfactory in cases where it is essential to obtain steadiness of the eyeball, the two points of fixation and the flexibility of the central blades enabling the operator to hold the globe with a minimum amount of pressure. The second instrument, of which a cut is also given, he claims is equally service-



COUSINS' CLAMP.



COUSINS' FIXATION FORCEPS.
(Medical Register.)

able for four special surgical purposes: first, as a clamp to arrest hæmorrhages; second, as a torsion instrument; third, for applying ligatures to a bleeding vessel; and, fourth, as a needle holder.

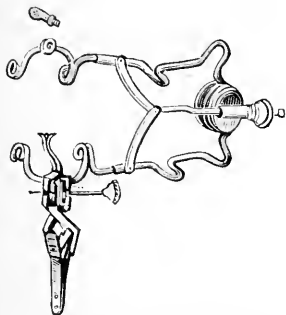
We herewith give cuts of Armaignac's modification¹⁷³_{Mar.} of his own forceps for the extraction of the anterior capsule of the lens. As changed, it has a double curvature given to the cutting edges, by which, when the teeth grasp the membrane, the iris remains untouched between their bite, as well as the extremities and the arms of the instruments. He has also contrived an ingenious blepharostat, of which we append cut. A glance at the mechanism will readily explain its use.

The accompanying illustration gives a very good idea of the McKeown instrument¹⁷¹ for intraocular injection in cataract extraction.

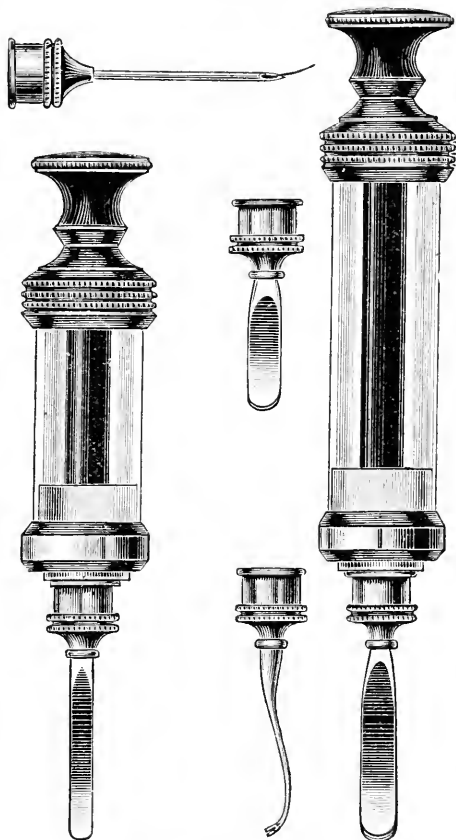
Mules²_{Jan.7} has contrived an ingenious vitreous inserter, designed for use with his evisceration scoop. It consists of a piston so arranged as to press an artificial glass vitreous into the bulbar cavity, while the edges of the flaccid sclera are separated sufficiently



ARMAIGNAC'S FORCEPS.
(*Recueil d'Ophthalmologie.*)



ARMAIGNAC'S BLEPHAROSTAT.
(*Recueil d'Ophthalmologie.*)

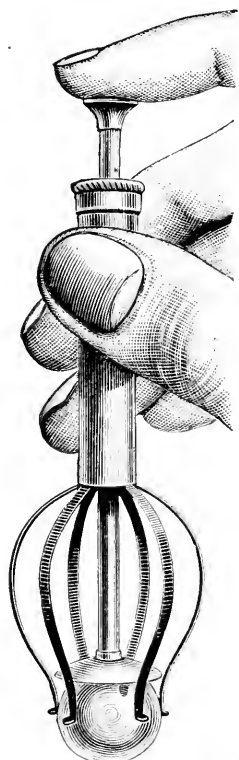


McKEOWN'S INJECTOR.
(*Annales d'Oculistique.*)

by several attached spring-like tenacula. The accompanying sketch shows its construction.

Doyne⁷⁶_{Mar.} has given us a new form of adjustable stereoscope designed for the purpose of thoroughly carrying out orthoptic training of the eyes. It may also serve as an instrument for diagnosis in testing binocular vision, convergence, and divergence.

Inonye, of Tokio, Japan,¹⁹⁰_{Sept.} has associated the Graefe and Beer cataract knives, and finds that this combination serves most excellently in his practice amongst the Japanese. The accompanying explanatory cut gives a very good idea of its construction.



MILES' VITREOUS INSERTER.
(*British Medical Journal.*)

Jackson⁹_{July 28} has contrived a combination Graefe-Beer cataract knife. "With it, the puncture and counter-puncture are completely under control, the flap is completed at a single thrust, the aqueous is not lost until the incision is nearly finished, and the counter-pressure by the back of the knife assists in steadying the eye."

Tansley⁶¹_{Aug. 4} has given us an improved lachrymal syringe. "in which the nozzle ends in a closed bulb, the openings being on the sides of the tube." He has also devised a clamp to prevent the passage of mydriatic solutions into the canaliculi.

Hubbell¹⁷⁰_{July} adds to the list another electro-magnet composed of a core of small, soft-iron wires around a large central wire of sufficient size to receive the extensions or needles. The coil is multiple, and consists of four wires running from one connecting post to the other. For it he claims the following advantages: its great power

of attraction, its lightness, its small size, its shape, and its convenience for manipulation. From these combined qualities he deems it a most valuable and desirable instrument, if not the best manu-



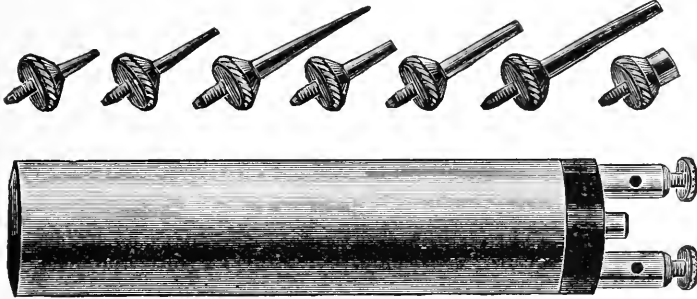
INONYE'S CATARACT KNIFE.
(*Centralblatt f. Augenheilkunde.*)

factured. The accompanying cut gives a very good idea of its size and shape.

An oro-nasal veil intended to be used during ophthalmoscopic examination, so as to prevent offensive expiratory interchange, has

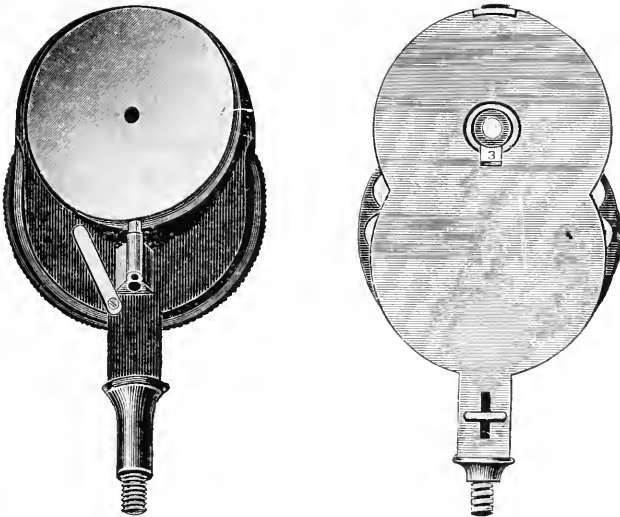
been suggested²_{Jan. 14} by Cousins. It consists of a silk curtain, suspended from a flexible wire, so arranged by hooked temples as to fit over the surgeon's nose and mouth. Suggestive lack of courtesy will probably abrogate its use.

St. Clair Buxton⁶_{Apr. 14} has devised an efficient and compact



HUBBELL'S ELECTRO-MAGNET.
(*Buffalo Medical and Surgical Journal.*)

ophthalmic cabinet. He says that the makers of the cabinet intend to fill "stock bottles with tabloids, the base of which will



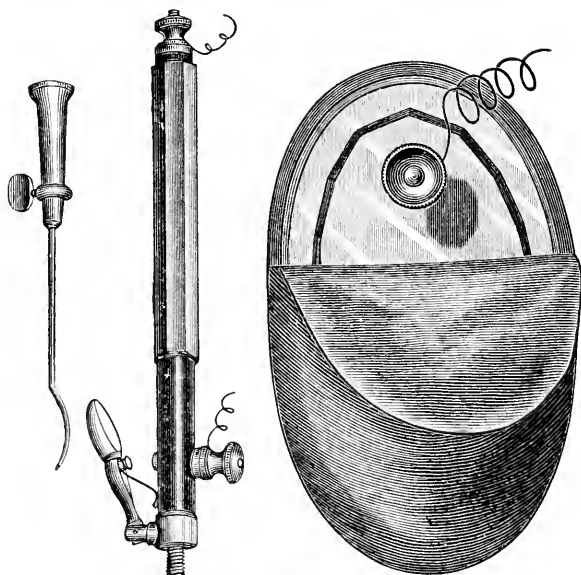
COXETER'S OPHTHALMOSCOPE.
(*Edinburgh Medical Journal.*)

probably be boric acid," each containing "a stated quantity of the active agent, to be dissolved in water, according to the strength required, in order to form the solutions for the drop bottles. He thinks this plan "possesses an obvious advantage, inasmuch as the tabloids will preserve the agents for any length of time."

Coxeter²⁶_{Feb.1} has added a cheap and compact ophthalmoscope to the already overfilled list. This one is intended for students' use.

Jessop's convenient and handy instrument²_{Dec.24,'81} for electrolysis explains itself in the cut herewith presented.

Wilmer⁵⁹_{Mar.17} presents to the profession a very ingenious device to ascertain the proper adjustment of prisms. It consists of a



JESSOP'S INSTRUMENT FOR ELECTROLYSIS.
(*British Medical Journal.*)

delicate spirit-level fastened to the spectacle-frame above the nose-piece. For increased facility in the use of prisms, Emerson²¹²_{Feb.} has constructed a frame holding Nos. 2, 4, 6, 8, 10, 12, 14, and 16 fixed, and two additional movable prisms, Nos. 1 and 16. By



ANDREWS' MODIFICATION OF AGNEW'S BIDENT.
(*New York Medical Journal.*)

sliding the two movable prisms in front of the fixed ones, all manner of combinations can be readily obtained.

Andrews¹ has constructed an ingenious and valuable attachment to Agnew's bident—shown above.

Schubert¹⁹⁰_{May} has designed a pair of protective glasses intended for workmen, composed of plain, transparent fronts, and ventilated

metallic sides. Browne²_{Dec. 10, '97} has added an irrigator for cocaine to the ordinary tenotomy hook.

The accompanying cut shows the full size of an ingenious drainage tube made by A. D. Williams,¹⁰⁹ for the purpose of keeping orbital cysts patulous. It is composed of lead. The thick bulbous extremity is inserted into the cavity, whilst the flange protrudes at the free extremity and prevents the tube from slipping inward.



SECTION VI.

STATISTICS AND UNCLASSIFIED.

Skrebitzky,²¹_{June 18} from the reports of the two orphan asylums of St. Petersburg and Moscow and of two other hospitals, concluded that from 8 to 12 per cent. of the newborn among the poor of St. Petersburg suffered from *ophthalmia neonatorum*. Hippius concludes that the proportion in the St. Wladimir Children's Hospital of Moscow is 8.08 per cent. Snell⁶_{Sept. 1} concludes from the statistics of the Sheffield School for the Blind that 38.3 per cent. at least of the cases of complete blindness were due to this affection. Bell⁶_{Apr. 14} thinks that 72 per cent. of the blindness of England was caused by it. Widmark,⁷⁸_{Apr.} after careful inquiry, concludes that 0.32 per cent. of all infants born in Sweden in 1885 had *ophthalmia neonatorum*, a number much below that of other countries.

Djakonow²¹_{Aug. 6} has studied the number and the causes of *blindness in Russia*. His statistics cover 2792 cases of binocular, and 5069 of monocular blindness, mostly from the Moscow Clinic, from July 1, 1878, to July 1, 1886. The percentages, as regards the etiology of binocular cases, are as follow: Congenital, 3.19; idiopathic diseases of the eye, 74.68; injuries, 3.22; unknown, 1.94. Glaucoma is credited with the enormous percentage of 22.74; corneal affections, 18.52; optic atrophy, 14.11; *ophthalmia neonatorum*, only 5 (?). According to Dr. Maklakoff, the official report of the number of blind in Russia in 1886 foots up 189,872, or 20 to every 10,000 inhabitants. The rural population has, over the city, double the number of blind. It is said²²_{Aug. 22} that among the Russians the following are the numbers of the blind: In every thousand inhabitants 8 blind people are Polish, 10

Lithuanians and Jews, 19 Russians, 22 Ehonians, 35 Bashkirs, 51 Tartars, and 83 Votyaks. Only an eighth of the total number of cases are due to small-pox, and about one-half to affections of the eye proper. Italy,¹⁷¹_{Mar} according to an official report, has 14 institutions for the *education of the blind*. The number of blind is given as 7.6 to every 10,000 inhabitants. The 14 institutions contain about two-fifths of the blind from 8 to 16 years. To ophthalmia neonatorum is ascribed but 18.9 per cent. of the blindness, whilst 27.6 per cent. is charged to purulent ophthalmia.

An inquiry²_{Nov.17} as to the number and nature of *cases of blindness* in males, due to accidents and occurring after 15 years of age (Scotland), resulted as follows: Of 1454, 1095 lost their sight after school age, and of these 219, or 20 per cent., from preventable causes. Sixty-five per cent. of the accidents were among iron-workers, miners, and quarrymen, and of these 34 per cent. were monocular injuries, the sight of the other eye having been impaired through sympathy. Sir Wm. Thompson advises the use of goggles in such occupations, made strong enough to resist the force of an ordinary chip of iron or stone. Lopez¹⁷³_{No.11,87} finds that in Cuba the Chinese furnish one-half as many more diseases of the eye as the whites, while the blacks and mulattos furnish but 64 per cent. The Chinese are greatly predisposed to corneal affections.

Saltini,³⁰_{V.16, No.6} found among 954 school-children of Parma 24.64 per cent. *myopic*. Of these 15.75 per cent. was proved due to heredity. In the 11th to the 12th year the myopes were 13 per cent. of the children, while from 13 to 18 the proportion rose to 27 per cent., and above 20, to 29 per cent.; 14.60 per cent. of 389 myopes were dolichocephalic, 22.42 per cent., mesocephalic, and 62.98 per cent. brachycephalic. Of 985 emmetropes, 9.63 per cent. were dolichocephalic, 18.17 per cent. mesocephalic, 71.46 per cent. brachycephalic. Of 128 hyperopes, 10.49 per cent. were dolichocephalic, 19.52 per cent. mesocephalic, and 69.35 per cent. brachycephalic.

From the official Government Report we gather the following as to the *injuries to the eyes* occurring in the German army in the war of 1870-1: Of 75 cases of corneal injuries 30 were due to rifle-balls and projectiles, 13 to small metallic splinters, 10 from powder explosions, 6 from stones thrown, 8 from bayonet thrusts (not from the enemy, however). There were 20 injuries to

the iris ; 4, luxato-lentis ; 20 cases of foreign bodies in the eye, etc. There were 67 surgical operations, of which 34 were enucleations, 5 cataracts, 7 iridectomies, 17 lid operations, etc. Ninety-nine cases of sympathetic trouble are noted.

Faravelli and Gazzaniga³⁰_{V.17, No.1} give maps showing the geographical distribution of *trachoma* in the Italian province of Pavia. To this cause is ascribed 1.03 per cent. of the monocular blindness and 1.88 per cent. of the total. It comprises 11 per cent. of the total number of ocular diseases.

Deneffe¹⁷¹_{June} has collected the statistical results of the principal examinations made in reference to *subnormal color perception*. The total number of persons examined by 41 physicians foots up a grand total of 203,383, of whom 4640 were so-called color-blind, a percentage of 2.28. The number of school-boys examined by 19 physicians was 30,177, the color-blind, 1265, or 3.22 per cent. The number of women examined by 22 experts was 33,526, and of these only 43 were color-blind, and, deducting the highly exceptional results of Minder, the percentage in this case is reduced to 0.079. Badal⁷⁰_{May 27} finds in the ocular manifestations of *syphilis* that the iris is by far the most frequent organ attacked. In 631 cases, the iris was the seat of trouble in 242 cases ; the choroid (and vitreous), 141 ; optic nerve, 139 ; third pair, 107 ; retina, 57 ; sixth pair, 28 ; nervous centres, 25 ; lens, 16 ; cornea, 12 ; lids and conjunctiva, 11 ; orbital bones, 5 ; fourth pair, 5 ; fifth pair, 2 ; seventh pair, 2 ; lachrymal organs, 1. Accompanying these manifestations there were, intercurrently, 49 cases of locomotor ataxia ; sundry cerebral troubles, 21 ; hemiplegia, 19 ; deafness, 11 ; epilepsy, 4.

In the desire that our profession may be the means of promoting the interests of many worthy applicants and of increasing the efficiency of the Pension Department by contributing the very best skill for the examination of this particular class of applicants, Wright²³³_{June} presents a plea for the better recognition of the oculist in the service of the United States Pension Department.

Kroll⁵⁷_{Oct.14} employs transparent red-green test-types in the stereoscope for the detection of simulated monocular blindness. Michaud's suggestion²⁴³_{Apr.} of combination words and letters, seen differently with the right, left, and both eyes respectively, for the same purpose, though ingenious, is by no means new.

OTOLOGY.

BY CHAS. S. TURNBULL, M.D., PH.D.,

AND

CHAS. L. WEED, A.M., M.D.,

PHILADELPHIA.

PHYSIOLOGY, EMBRYOLOGY, AND ANOMALIES.

It was formerly a common opinion, based upon the post-mortem examination of deaf-mutes from aural (not central) cause, that the ossicles are essential to hearing. Toynbee restricted this dictum to the base of the stirrup, whose removal, he argued, must involve a loss of the labyrinthine fluid. The experiments of Kessel upon dogs and pigeons showed that such is, however, not well founded. After complete removal of the bones (including the stapes *in toto*), the animals exhibited no alternation in attitude, gait, or mode of flight. They betrayed neither vertigo nor inco-ordination. There was, indeed, a temporary deafness, generally for about eight days, lasting as long as the labyrinthine discharge continued. Thereafter the function of hearing gradually returned. Autopsy showed a closure of the foramen ovale by a pseudomembrane. Notwithstanding the apparent innocuousness of such an operation, it has never been performed upon the human subject. Schwartze expresses a fear of purulent otitis interna and consequent meningitis and condemns any operation for the improvement of hearing or the subjugation of tinnitus which is not absolutely without peril to life. In the absence, therefore, of operative experience clinical observations become of great value.

Berthold³⁴_{Bd.19,H.1} contributes the report of a case noteworthy in many respects. For although it happens not infrequently that the ossicles, and among them the stapes, are freed from their connections by inflammatory processes, it must be very exceptional to find the stapes turned in the drum-cavity with its base attached to the drum-membrane. It is remarkable that no scar could be recognized on the drum-membrane. It is also surprising that the patient complained of such violent vertigo and such marked

disturbances of co-ordination during the first twenty-four hours after the operation, although no discharge of labyrinthine fluid was observed, and, therefore, must have been very trifling, if any existed at all. But even if there had been a flow which escaped notice, the behavior of the patient does not accord with the observations made on the doves operated upon by Kessel, though from these latter observations we are probably not justified in drawing conclusions with regard to the human subject.

As regards the degree of acuteness of hearing in the ear in question, the case is thus far unique, for it is, to use Toynbee's words, the first well-authenticated case in which loss of the stapes was not followed by complete deafness, but in which a tolerable degree of hearing remained; without stapes and with co-existing perforation of the drum-membrane loud speech was heard near by, and upon mechanical closure of the perforation whispered speech was understood at fifteen feet. Although the above-mentioned case cannot be cited in justification of the extraction of the stapes in this case, since the operator's hand may not easily imitate what nature accomplishes through an inflammatory process, the fact remains that relatively good hearing is possible without the stapes.

S. O. Richey²³¹_{Oct.} contributes a most valuable and interesting paper on "The Primary Physiological Purpose of the Membrana Tympani," which he concludes, with: Gegenbauer,¹²²⁷_{p.527} that "other parts are gradually added as accessory organs to the auditory organ, although primarily having no relation to it." By accessory organs he indicates the development of the bony tympanic cavity from the first branchial cleft; the involution of the pharyngeal mucous membrane, forming the Eustachian tube; the involution of the integument, forming the external meatus; the formation, at the points of overlapping of these canals, of the drum-membrane; these two tissues, with the membrana propria, developed from the connective tissue lying between, making up the tympanic membrane. Evidently the development of these structures subsequent to the existence of the perceptive organ, and exterior to it, was with a purpose other than sport. When the simplicity with which nature usually works is borne in mind, we cannot believe that it was for the purpose of merely making the organ more complex. Can we be certain that the existence of a transmitting mechanism improves the perception? A temporary opening of the tympanic membrane,

without other tympanic structural change, does not noticeably impair hearing. In view of the otherwise guarded position of the labyrinth, is it not most rational to suppose the tympanic membrane to exist, also, for that purpose; especially with the history of the contemporary development of the eye and its appendages, and the lungs, with their more central location and appendages, and the protection which this implies? This theory of the primary purpose of the tympanic membrane opens up a vast field of aural therapeutics for consideration. One must be often impressed with the frequency of *ad captandum* methods, and the sad experiences and failures in manipulating this obscure organ. We see the immediate effect of the air-douche; what is the remote result of its frequent repetition? What was the rationale of the endeavor to maintain an opening in the tympanic membrane in "progressive deafness," when by proper management the Eustachian tube could be kept patulous? Why has so much attention been exhausted upon the tympanic membrane, when its changed appearance is so manifestly due to alterations in the structures behind it? The philosophy of surgical violence to this delicate organ, unless in case of destructive disease, is questionable. Nature is wise, and her effort, so persistent, to heal a drum-membrane, whether a perforation is the result of surgical violence or of disease, would indicate some other object in the existence of the membrane than the transmission of sound-waves. If this were not so, why should an opening in the membrane designed by the surgeons close, regardless of attempts by tents, eyelets, etc., to keep it open? My impressions of the advisability of an imperforate membrane are so strong that I have never made an opening in it, except to evacuate fluid from the cavity. On the other hand, for more than ten years it has been my systematic practice to endeavor to close such openings. In case of chronic suppuration of the cavity, if the drum-membrane is not restored, the discharge will recur at intervals. In no case in which the drum-membrane has been restored under my observation have I learned of a recurrence of the suppuration. Such a result presupposes the destruction of the pyogenic membrane and all general matter, but it also suggests some other purpose for the existence of the tympanic membrane than its participation in the transmission of sound-waves to the internal ear.

Limits of Hearing.—J. K. Love²¹³_{Sept.} has written an interesting

and extensive paper which he concludes as follows: "1. Notes produced by fifteen or sixteen vibrations per second are the lowest which can be heard by the human ear. The difficulty of producing vibrations of sufficient amplitude to make such notes heard is great, but it is probable that sounds caused by a smaller number of vibrations are perceived as separate impulses, and not as true musical sounds. Many ears cannot hear notes caused by less than twenty-four vibrations. 2. The most powerful very high notes are produced by very small tuning-forks, and by them a vibration number of over forty thousand has been heard by Preyer and a few other observers. Other and more convenient means for producing very high notes are Galton's whistle and the small open pipes described in this paper. These tests show that most ears can hear nothing when the vibration frequency is over thirty thousand per second. Many are deaf to notes produced by more than twenty thousand, and some to notes of fifteen thousand vibrations; in a few cases deafness to notes of five thousand two hundred or five thousand five hundred vibrations has been recorded. 3. The last observable difference in pitch for untrained or slightly trained ears is difficult to state, but (exclusive of cases of tone-deafness) it may be put down as from one-sixth to one-fortieth semitone. The ears of such trained musicians as violinists, tuners, and some pianists can perceive with certainty a difference of one-sixty-fourth to one-eightieth semitone. All observers, but especially the untrained, detect sharpened better than flattened intervals. Generally speaking, Weber's law holds good for all but the highest and lowest parts of the musical scale."

Color Hearing.—Does the color impression come through the optic or the auditory apparatus? Baratoux, collaborator, in his theory on this subject has furnished a more or less ingenious hypothesis, claiming that an examination of the facts shows that the chromatic centres can be excited not only by impressions upon the retina, but also by those upon other organs of sense. If we admit that the cellules of certain senses are directed or attracted to their centres more or less distinctly by nerve conductors, it is natural to suppose that certain auditory cellules are attracted to similar elements of the chromatic centre. This would easily explain why such an auditory cellule when irritated should always produce the same impression. He believes that the color hearing is a physio-

logical phenomenon, and that we have to-day examples of nervous irritation (excitation) irradiating itself from the chromatic to the auditory centre. With some persons, sound suggests the idea of smell or taste, and there are others who perceive colors that are produced by high-pitched sounds, etc. It is the same with the other senses, and there exists between them reciprocal physiological impressions. The author holds that color hearing is physiological, and that it is due to irradiation of sound impressions to the sight centre, causing the latter to functionate.

The Sacculus Endolymphaticus.—The former assumption that the sacculus endolymphaticus has in the higher vertebrates a blind ending has been shown by Rüdinger ³¹_{Feb. 21} to be untenable. There are numerous long accessory canaliculi proceeding from various portions of the fundus in the mammals and man, which minutely subdivide and are continuous with the subdural lymph-spaces of the dura mater. Rüdinger looks upon these as canals for carrying off the endolymph of the membranous labyrinth, and as rudimentary homologues of the canals and sacculi which are found in the greatest variety of size and form in fishes, batrachians, and reptiles. Hasse inferred at first from his studies of comparative morphology that the sacculus endolymphaticus communicates with the lymph-channels of the subdural space, but from later investigations he deemed this inadmissible, and agreed with Schwalbe, who had injected the perilymphatic space from the subdural spaces, that in all probability the endolymph finds exit through the arachnoid sheaths of the nerves and vessels going to the membranous labyrinth. According to this assumption, the endolymph must pass through neuroepithelium, and therefore in the interepithelial spaces to the internal auditory canal, and thence by lymph-channels into the cranium. In support of Rüdinger's thesis are the embryological facts that the recessus labyrinthi, out of which arises the sacculus endolymphaticus, extends beyond the sac in the form of canals, and that by means of interepithelial spaces and even larger lacunæ these are in immediate connection with the lymph-channels, and are even direct continuations of the same. The investigations of Hasse and Retzius, which demonstrate in many of the lower vertebrates that the endolymphatic canal extends to the cranial cavity and even farther, must awaken a doubt as to the blind ending of the sacculus endolymphaticus. It is highly

probable that the latter communicates directly in many animals and man with the subdural lymph-channels, and this furnishes a tenable hypothesis concerning the mode whereby the endolymph finds exit. That the saccus endolymphaticus as an elastic bag has utility in maintaining equilibrium of intralabyrinthine pressures can be deduced from its form and size. A simple epithelial tube would suffice for the exit of endolymph, while the recessus labyrinthi in higher vertebrates and man is developed into a sac-like form.

Fistulae Fissurarum Branchialium with Defective Membrana Tympani.—Ole Bull⁶⁶_{Mar.} reports a case in which traces of the first branchial cleft seemed to be left in the form of fistulae. On each side, at the beginning of the helix, a depression like that left by a small pinhead was to be seen; below these, in the skin over the sternomastoid muscle, were the openings of the sinuses, which admitted a probe to the depth of five millimetres. The drum-heads were defective, the membranæ flaccidæ being absent, the remaining part occupying the under half of the space visible by means of the otoscope. The boundaries of the drums in the upper and posterior part were not well defined. The malleus handle was much retracted. No alteration of the membrane could be seen after inflation. The respiration of the patient could be distinctly heard through the diagnostic tube. Frequently when the ear was syringed water issued from the corresponding nostril. Attempts to pass probes through the Eustachian tube failed, as they caused pain when introduced six millimetres beyond the beak of the catheter.

Anomaly.—Wagenhauser, of Tübingen,³²⁸_{v.26,p.1} describes the autopsy of a case of malformation of the left ear of a newborn child. The auricle is represented by an irregular, long thickening, in front of which a small, shallow pit is situated. In this thickening lies a thin, cartilaginous plate. The cartilaginous auditory meatus is wanting. The annulus tympanicus does not exist; an osseous plate with an indentation directed downward like an arch, closed by a firm, grayish-blue membrane, exists in its place. The cartilaginous tube is permeable, the osseous one ends blindly in a narrow canal. The tympanic cavity is narrowed, especially in its lower part, by dense masses of bone; the malleus and the incus are incompletely developed; the stapes, the musculus stapedius, the windows of the labyrinth, the ostium tympanum tubæ, and the musculus tensor tympani are entirely missing.

GENERAL DIAGNOSIS.

Weber's Experiment.—Gellé³⁷_{Nov.5} offers a semeiological study upon the value of Weber's experiment in the diagnosis of ear disease. The phenomenon of the tuning-fork being heard better upon the stopped ear than upon the other side can be accounted for in two ways: through the formation of a resonant space and through the heightened tension of the membrana tympani, both conditions are fulfilled by the insertion of the finger in the auditory meatus. In twenty-nine unclassified clinical cases the author found twenty-five in which the fork placed upon the apex was heard better upon the diseased side. In nine of these twenty-five cases the tone was modified by a pressure of the finger, and of these nine seven have improved very rapidly; sixteen cases in which at first the modification was not observed, nevertheless exhibited the same at a later stage; five remained unimproved. In twenty-one clinical cases the tuning-fork was heard only from the apex; of these there were only six cases in which the Weber experiment showed a transference of sound to the affected side, and four of these were rapidly and completely cured. The fifteen remaining cases in which Weber's test was negative were bilateral affections, principally sclerosis. From a negative Weber's test Gellé believes that an unfavorable prognosis may be assumed.

Diagnosis of Certain Ear Affections by the Tuning-Fork.—O. D. Pomeroy¹_{June 23} concludes "that the greatest amount of bone-conduction proceeds from a normal ear closed, and that the principal diagnostic sign of labyrinthine disease appears in weakened bone-conduction; that the apparent increase of bone-conduction in middle-ear disease will disappear when the test is made with the ear closed, when it will be found not to exceed that of the normal ear; in those cases called 'mixed' the bone-conduction will be found weakened when the test is made with the ear closed, although with both ears open the affected one may have better bone-conduction than its fellow; that, so far, it seems that the good or bad condition of the middle-ear mechanism has little influence on bone-conduction; that the occasional phenomenon of intermittent bone-conduction cannot be satisfactorily explained; that cases of pure labyrinthine disease cannot always be distinguished from those of middle-ear affections with secondary labyrinthine changes by the tuning-fork, and that the history of the cases must materially

aid us in the distinction; that the phenomenon of secondary labyrinthine changes in middle-ear diseases is easily explainable; that there are numerous exceptions to the rules for finding the best points on the head for eliciting bone-conduction; that the bone-conduction is rarely or never of less than its proper ratio to aerial conduction."

Diseases of the Ear in the Negro.—T. E. Murrell, Little Rock, Ark.,⁴⁶²_{p.217} says that eczema is seldom seen, parasitic otitis never. Suppurative forms of otitis media are not infrequent in children of the race, but are seldom seen in the adult. The mastoid process is but slightly developed, and mastoiditis is never seen. Chronic aural catarrh is so rare that the negro may be said to enjoy complete exemption from it, as also from affections of middle ears, nose, and pharynx. Hypertrophic rhinitis is extremely rare. Out of a few thousand whites, one can generally pick out a few persons disagreeably deaf from some middle-ear process, but rarely indeed is a negro thus affected. Again, deafness as a senile change is rare. At times of sweeping epidemics of cerebrospinal meningitis, with its thousands of victims, it is of rare occurrence in the full-blooded negro. Deaf-mutism, however, occurs. Errors are made in reporting the negro as "colored," when by far the large majority are mixed. Murrell neglects, strange to say, to mention the great frequency of fibrous tumors of the lobe, to which Laurence Turnbull¹²²⁶₁₈₈₇ has repeatedly called attention, and the occurrence of which he attributes to the wearing of brass jewelry. Impaction of cerumen is of rare occurrence, not only on account of the large size of the meatus, but also because such collections are seldom found in plebeian ears. Luxury, meddlesome ablutions and the profligate use of soap cause impaction.

Differential Diagnosis of Peripheric and Central Diseases of the Ear.—In an interesting paper, D. B. St. John Roosa,⁹_{Apr.21} concludes as follows: "I have offered no apology for the assumption, easily deduced from what I have stated, that the neurologist is bound to attempt to differentiate between a central and a peripheric aural lesion. Many of the cases that present themselves to us have aural symptoms. The capability to examine the membrana tympani and the use of the tuning-fork in the manner that has been indicated will furnish the means, in the vast majority of cases, for an accurate differential diagnosis. I may

then recapitulate as follows the steps of the method which I have endeavored to demonstrate: 1. Determine the effects of noises upon the hearing power and sensibility of the patient. If noise increases or does not diminish the hearing power, the case is probably a peripheric trouble. It is central if noise diminishes the hearing. If noise is painfully disagreeable it also points strongly to central disease of the ear. 2. Observe whether the patients hear a watch relatively as well as the voice. Those suffering from lesions of the tympanum usually hear the human voice out of all proportion to their ability to hear the tick of a watch. 3. Test the aerial and bone-conduction by means of the tuning-fork C 2. If the vibration be heard better and longer through the bone it is only exceptionally that the disease is not peripheric. If, on the contrary, they be heard better through the air, the disease is one of the labyrinth or of the trunk of the nerve or of the nerve centres."

F. Massei, corresponding editor, Naples, reports that Jasano,⁵⁰⁰_{No.21} repeating Wamba's, Urbantschitsch's, and Fechner's experiments on the influence which acoustic stimulation produces upon other sensations, has arrived at different conclusions, but, considering his more limited experience, does not pretend to make a law of them. Dr. Massei also writes that, on the perception of a diapason sound applied upon the inferior maxillary bone, Masini⁶²⁴_{July} makes some applications to the diagnosis of ear diseases. According to him, if a vibrating diapason is applied on the inferior jaw-bone at the point of issue of the third branch of the fifth pair, the sound is heard, strengthened from the opposite side. If one of the aural ducts be shut with a finger, the sound is always perceived from the obstructed ear, but stronger when the ear opposite to the side where the diapason is applied is shut. When both ears are shut the sound remains crossed and unchanged. When both membranes are pressed together firmly, the sound becomes indistinct, and it is not possible to say from which side it is heard. His conclusions are as follow: 1. In the affections of the Eustachian tube and in those of the external aural ductus, the sound is always heard on the shut or *impaired* side stronger than on the crossed side. 2. In cases of disease of the tympanic cavity without involvement of the acoustic nerve, it is always heard from the direct side, though one side is more impaired than

the other. 3. In cases of diseases of the tympanic cavity with hyperæsthesia of the acoustic nerve, or in cases of this condition only, the sound is heard from the hyperæsthetic side, but stronger on the crossed side. 4. In cases of disease of the internal ear (atony or atrophy of the acoustic nerve), with or without impairment of the tympanic cavity, the perception of the crossed sound is abolished, while sometimes the direct sound continues (although very weak).

Electrical Reactions of the Acoustic Nerve.—Gradenigo³²⁸_{Vol. 27, H. 2, 3} has observed the following electrical reactions in the acoustic nerve: 1. In normal conditions there is no acoustic reaction to the current. In order to obtain any reaction the auditory parts must be diseased. 2. There is an acoustic reaction in all cases of disease connected with hyperæmia. There is never a reaction without hyperæmia. 3. There is a reaction in the initial stages of neuritis. 4. The reaction of the acoustic nerve is exactly like that of any other. 5. The character and duration of the sound provoked by the passage of the current are influenced by the nature of the morbid affection, by the remedies employed, and by individual idiosyncrasies. 6. The acoustic reaction is attributable to the nerve rather than to the labyrinth.

F. Massei, corresponding editor at Naples, writes us that Gradenigo, who accords but a palliative value to galvanization in aural therapeutics, concedes to it an important place in diagnosis and prognosis. He considers the electric method of examination of the acoustic nerve a much more delicate proof than the functional examination. If the external test, with currents of eight to ten millampères, be employed the pain is moderate and the results satisfactory.

DISEASES OF AURICLE AND EXTERNAL EAR.

Syphilis of Auricle.—Robert Barclay²⁴⁵_{Mar.} describes an interesting case of tubercular syphilide of the auricle, becoming serpiginous, with ulceration and sequestration of the cartilage of the concha, tragus, and canal. The left auricle presented the following appearance: General outline, normal. The first abnormality to strike the attention was the peculiar deformity of the concha—the upper and lower extreme limits of which were presented—and the absence of the tragus and the meatus. The beginning of the helix above

was at an oval pit in the concha, and the internal notch below was a circular pit. (See Fig. 1.)

There was a shining, bulging, yellowish spot—resembling somewhat a sebaceous cyst—right over the site of the normal meatus, upon a strong band of cicatricial tissue extending downward and backward from a spot above and in front of the site of the normal tragus, which band completely closed the meatus, and, with the exception of the oval and circular pits above described, completely filled the concha. Except a slight tightening of the skin, a seeming loss of subcutaneous tissue on the anterior side, and a slight drawing outward and forward of the auricle, it was otherwise apparently normal. Above and anterior to the site of normal tragus and near that of the temporomaxillary articulation was a cicatrix. Membranous atresia followed, naturally, with deafness, but later operation was followed by a cure.

Aysagner⁴²¹_{v.3,p.33} recommends lactic acid for cauterization of the tympanic cavity and the external meatus, both for suppuration and for granulations. He instilled 50 per cent. solutions; he has, however, successfully employed the lactic acid in the pure form.

After its application the ear should not be syringed, as after the application of other astringents.

From Koll's report of the University Polyclinic at Bonn⁶⁶_{v.17, No.3} we may note especially the experiments made with powdered iodoinsufflations into the ear. The remedy effected a speedy cure in non-complicated cases of acute and chronic suppurations of the tympanum. Caries and formation of granulations were not markedly influenced by the drug. Iodoinsufflation is by far less valuable than boracic acid, on account of its irritant qualities. Gruber³⁸⁵_{Nos.6,7}

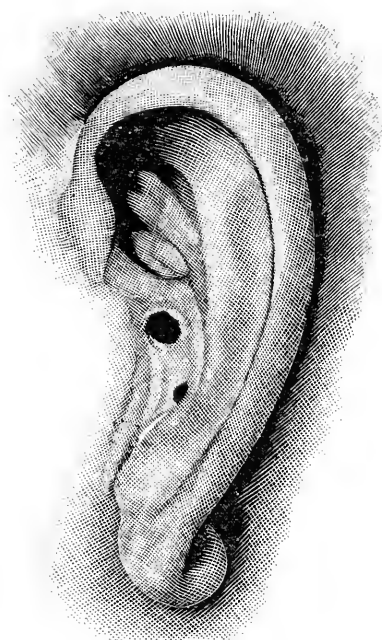


FIG 1.—TUBERCULAR SYPHILIDE OF THE AURICLE.
(*Journal of Cutaneous and Genito-Urinary Diseases.*)

observed three cases of inflammation of the external auditory meatus with green secretions, one of which was produced by simple transference. Although no inoculation experiments with pure cultures were made, a small, thin, and very agile bacillus, which develops well at the temperature of the room upon gelatine, agar-agar, and potatoes, must almost certainly be considered as the cause of the affection. The culture grows better upon the superficial layers of gelatine than in the lower ones, and causes a gradual downward progressive liquefaction with marked green coloring. Upon agar-agar a grayish-yellow coating develops, the circumference of which takes a marked green color. The same process takes place upon potatoes. According to the described qualities, we have to deal with bacillus pyocyaneus, although no toxic qualities have heretofore been ascribed to it. Gruber considers himself justified in believing that Zaufal's cases of "blue pus" were also due to the same bacillus.

Resorcin in Diseases of the Ear.—From the report of G. N. Scott, corresponding editor, Moscow, Russia, we learn that S. von Stein⁵³⁰_{No.1} finds that resorcin curdles albumen, and does not produce salts that are not soluble; both as a caustic and an astringent it is not inferior to nitrate of silver, but has the advantage of being at the same time an anæsthetic. It is a good antiparasite and anti-ferment. As all solutions hitherto in use for dropping into the ear have invariably macerated the tympanum, the author thinks resorcin will be freely used in the future, since in weak solutions it regenerates epithelium without macerating the drum. Moreover, its antiseptic virtue and slightly anæsthetic influence on the peripheral nerves make it a good antiphlogistic remedy. For producing a still greater effect on the less superficially situated lymphatics von Stein adds hydrochlorate of cocaine, prescribing thus: Aq. destil., 30 (parts); resorcini, 0.3–0.5; morph. hydrochl., 0.01–0.03; cocaini hydrochl., 0.2 (for children, cocaini, 0.02; morph., 0.005); ten to fifteen drops, warmed, to be kept in the ear from five to fifteen minutes: afterward the ear is dried with hygroscopic cotton-wool.

DISEASES OF THE MIDDLE EAR.

Chronic Catarrhal Inflammation of the Middle Ear.—Buck,⁶⁶_{v.17, No.1} referring to this disorder, expresses the opinion that it proceeds mostly from the same condition in the nasopharynx, and

believes that remedies addressed to these parts alone will, in the majority of cases, effect greater improvement than treatment to the ear itself. As to the causes of these pharyngeal troubles, he thinks the most important are—smoking, the American craze for fresh air in bedrooms, and a gouty tendency. When the process has gone on to sclerosis of the mucous tissues, he deems it incurable. For local applications to the pharynx, he prefers nitrate of silver solutions, made by means of absorbent cotton on a probe.

Tilley, of Chicago,<sup>462
p.344</sup> makes the well-directed point that all subjects of chronic otitis media plastica (catarrhalis?) should be searched for traces or symptoms of syphilis, acquired or inherited.

Turnbull, in a series of experiments in chronic otitis media, has been disappointed in iodol. It is not a true antiseptic, but only a stimulant. It cannot be compared with iodoform in syphilitic disease of the ear, nor is it as valuable and free from irritating qualities as pure boracic acid. It covers up the ulcerated surface, and when removed the ulcer has not that healthy, bright-red color that follows the application of iodoform or boracic acid. Its only advantage is that it is free from poisonous qualities.

Although Schwartze<sup>1223
1885</sup> declaims against the treatment of purulent otitis media with powdered boracic acid, Bezold, nevertheless, recommends it. The beneficial results obtained in the greater number of cases are confirmed by his own experience and that of others. He excepts those rare cases in which the insufflation of boracic acid into the widely opened tympanic cavity is followed by copious serous discharge and intense pain, and those in which the integument of the external meatus shows a still greater reaction. Although the small perforations of Shrapnell's membrane, when treated with boracic acid, are followed by a fatal result, yet it should be remembered that the prognosis in such cases is in any event an unfavorable one. Within three years Bezold observed a fatal termination of three cases of perforation of Shrapnell's membrane among thirty-seven cases of this form, but he proves that death could not have resulted from the treatment. He treated almost all cases of otorrhœa, with perforation of Shrapnell's membrane, with boracic acid, which was blown even through the curved Eustachian tube directly into the tympanic cavity. The mortality in these cases amounted only to 0.8 per cent. He observed frequently that boracic acid not only does not hinder the

discharge of pus, but even favors it by imbibition. He considers iodoform powder also indispensable, but, on account of its insolubility, it should be inflated in very small quantity. Whether or not packing of the external meatus with powdered boracic acid may produce bad effects by retention of secretions can only be decided by statistics of a great number of cases of suppurative otitis. Bezold does not believe that the mortality of 0.8 per cent. with his treatment exceeds that of any other method. It will be often remarked that the discharge is favored rather than impeded by the boracic acid covering the perforated drum-membrane.

In the well-known tedious cases of so-called dry middle-ear catarrh (otitis media hyperplastica), in which the different internal and external remedies are ineffective, it is possible sometimes to produce marked improvement with the duplex inductorium, and almost always the disagreeable accompanying symptoms, tinnitus and headache, can be relieved in from three to five minutes. When the current is applied to the side the effect upon the patient is a very surprising one, and in astonishment he declares: "Now the one side is perfectly clear and free from pain and noise, whilst the other half is still noisy and painful as before." This miraculous effect is explained by the change in the pressure relations in the cranial and labyrinth cavities in consequence of contraction of the blood-vessels and muscles of the neck and ear, and it promises a future prominence of great therapeutic importance to the duplex inductorium, not only in diseases of the ear, but also in those of the brain and its envelopes.

L. Turnbull, ¹_{June 23} in a paper on "The Treatment of Acute and Chronic Purulent Inflammation of the Middle Ear," says: "It has been found that functional disturbances of hearing were produced by chronic purulent inflammation, by the cicatrices and changes in the membrana tympani, and by adhesions in the middle ear, after all discharge had ceased. 1. The alterations in tension of the sound-conducting apparatus caused by the cicatrices producing irregular vibrations in the membrana tympani. 2. Cicatrices which caused adhesions of the membrana tympani with the promontory and with the articulation of the incus with the stapes, impeding the power of vibration of the ossicula. 3. If the adhesions were confined to the portion of the membrana tympani situated below the handle of the malleus, the acuteness of hearing had been found

to be considerable, while adhesions in the upper half of the membrane produced more disturbance of the hearing, or deafness, especially when the handle of the malleus was drawn inward and ankylosed with the promontory. 4. It has been proved that improved hearing power might exist even in cases of extensive destruction of the membrana tympani and with the loss of all the bones, except the foot-plate of the fenestra rotunda was not thickened."

Regularity of our perception of sound is due to the vibration produced by the ossicles; the membrana tympani can only be properly considered as a sound conductor in connection with the ossicles. Even if poor hearing of speech and music remained, the removal of the membrana tympani, or protecting membrane of the tympanic cavity, is dangerous, for it is deprived of covering essential to its condition in life. To retain and to restore to a healthy condition the diseased and ulcerated bones of the ear and the membrana tympani is of the utmost importance.

Victor Lange,⁶⁶_{v.17, No.1} in chronic suppuration of the middle ear, uses instillations of lactic acid of 15 to 30 per cent., with good result, inasmuch as very soon after the application the secretion promptly diminishes and the offensive odor is destroyed. The remedy has no effect upon dense granulations.

We would declare most emphatically against the use of powdered boracic acid in acute and subacute forms of middle-ear disease, accompanied with perforations of the membrana tympani. It is the misuse of this valuable medicinal agent that has caused so much dissatisfaction and disapproval among the inexperienced or careless readers. The disciples of Bezold have every reason to be charmed with the success of the boric acid treatment, whether "wet" (in aqueous solution and suspension) or "dry," save in chronic purulent fetid otorrhœas of long standing.

Lopez⁶²⁴_{June} illustrates three cases of syphilis of the labyrinth and another of complete occlusion of the exterior aural duct in consequence of a fibrous diaphragm from chronic inflammation of the middle ear in childhood. The diagnosis in the first cases was founded upon the history of the patient and the success of specific treatment, to which was added pilocarpin. (Report of Massei, corresponding editor, Naples.)

Our Moscow, Russia, corresponding editor, Dr. G. N. Scott,

sends us an abstract of a paper by Belayeff on "Pyæmia in a Case of Chronic Otorrhœa Complicated with Endocarditis Ulcerosa." ⁵³⁰
_{No. 17}
A young soldier having suffered otorrhœa for many years, was taken into the hospital with symptoms of meningitis besides the running of the ear. The ear contained a large quantity of pus; the upper and posterior part of the osseous external canal was found denuded and uneven. The enlarged liver and spleen caused the diagnosis to be meningitis and pyæmia, which was confirmed by the course of the illness. Temperature very high at night with severe fits of shivering; in the mornings 37° to 38.3° C. (98.6° to 101° F.). At first, patient had short periods of consciousness in the mornings, but toward the end he remained totally insensible. He died after nine days. Autopsy: the parietal part of the dura mater was thickened and adherent; when torn away near the external auditory canal, a little pus was found. The upper posterior part of the canal was very brittle; a probe very easily made a way into the cavity of the skull. On the endocardium here and there patches of thickened epithelium, and between the valves of the aorta a small ulcer covered with a fine-grained detritus. In right lung fresh metastatic abscesses and bronchiectatic cavities. Liver and spleen very large. A deep cut made into the gluteus muscle produced an ichorous, sanguineous fluid.

Thrush in the Middle Ear.—Valentin, of Berne, ⁵_{July} reports a case of a girl nine years old. The same aphthous growth extended over the mucous membrane of the hard palate, nasopharynx, and Eustachian region of the affected side. Beneath these patches the mucous membrane was disposed to bleed. The nares were free. Beneath the microscope the false membrane was shown to be composed of masses of pavement epithelium, numerous cells of thrush, with characteristic mycelium. The left ear emitted a peculiarly disagreeable odor. The auditory canal was filled with cheesy masses of the fungus, easily syringed out. The lower part of the membrane was destroyed. The fungus was found growing in the middle ear. The regrowth was obstinate on the hard palate, but disappeared entirely and permanently from the ear, under the internal administration of iodide of iron and malt, and the local use of 10 per cent. solution of sulphate of copper, which Professor Valentin prefers to alcohol or corrosive sublimate as a destroyer of fungi in the ear.

DISEASES OF MEMBRANA TYMPANI AND NERVOUS DEAFNESS.

Treatment of Chronic Purulent Inflammation in the Attic of the Tympanum (Recessus Epitympanicus).—Chas. H. Burnett ¹_{Nov. 24} writes as follows: “It is difficult to cure, especially when the attic has been the starting point of the disease, while those cases originating from without the drum-cavity (the traumatic) are easily managed. The cases of tympanic origin most easily cured or benefited are those in which the perforation in the membrana flaccida is large, and in which, of course, medication and drainage are most complete. Of the various forms of treatment the most successful are cleansing and antiseptic, as, for example, that by means of peroxide of hydrogen and carbolic acid. The only way of directly washing out the attic and of medicating it is by means of the tympanic syringe of Blake. The best applications have just been named, but alcohol and aqueous solutions of zinc, bicarbonate of sodium, chloride of sodium, lead, copper, etc., may be applied. Powdered applications are impotent in these cases, as the perforation is too small to permit their entrance into the diseased cavity. They might even do harm by blocking the small outlet for the pus, and thus aiding in forming a nidus for systemic purulent infection. All forms of escharotic or cauterant treatment, like that by strong solutions of nitrate of silver, are not borne by the attic when in a condition of chronic purulency, chiefly, I think, because the swelling of the edges of the perforation induced by such treatment closes it, drainage is interrupted, the pus undergoes decomposition, and a dangerous inflammation in the region of the tegmen tympani may be set up, as has once happened in my experience. So important is drainage in these cases that it has been suggested to obtain it by surgical interference, either by enlarging the hole in the membrana flaccida by continuing it up into the bone in the segment of Rivinus—*i.e.*, by cutting into the edge of the margo tympani of the inner edge of the upper wall of the external auditory canal—or by excision of the membrana tympani and the malleus and incus. One or both of these bones may be found necrotic. In fact, denuded bone can often be felt in these cases by means of a slender probe passed through the perforation. This dead bone can be scraped if the perforation is enlarged by excision of the ossicles, or by removal of some of the margo tympanicus. Thorough cleansing of the attic is demanded in these cases if a cure is to be

accomplished, and this washing out must be kept up after the attic is exposed by enlarging the perforation in the flaccid membrane or removing of the malleus and incus. A cure, more or less speedy, follows in such cases, according to Schwartz, Sexton, and others."

Masini,⁶²⁴_{Nov.} in order to procure anæsthesia of membrana tympani, in case of operations, applied the results of Wagner's studies, *i.e.*, electricity with a circular excitor to the nape of the neck, and with another represented by the common aural speculum of Montschom introduced into the ductus, precedingly full (one-third) of the liquid substance which he wished to try. Using currents of middle intensity, fifteen minutes at a time, applied upon a healthy ear (cocaine solution, 2 per cent.), he found that it abolished entirely the sensibility of the membrane (which was not the case when he used solution only). Anæsthesia was obtained more rapidly, using stronger solutions, but continued from five to thirty minutes. Solutions of 5, 8, and 10 per cent., with currents continued for twenty-five, fifteen, and ten minutes, allowed him to perforate the membrana tympani without pain. Solutions of 5 to 10 per cent., with very weak currents, five minutes long, brought the otalgia completely to an end. The same effect, but to a weaker degree, he obtained with morphine. Iodide of potassium was not satisfactory in the treatment of the hyperplastic otitis. (Report of Massei, corresponding editor.)

Artificial Membrana Tympani.—Sir William B. Dalby⁶⁶_{V.II,p.78} says: "From the fact that the majority of perforations of the membrana tympani during infancy heal without any treatment whatsoever, it does not follow that nothing should be done for these perforations; but they are better without treatment than under treatment with mineral astringents. Careful cleansing, together with the air-douche and applications of vegetable astringents, should be employed. Alcohol, iodoform, and boracic acid have, in some cases, a beneficial influence upon the secretion, but in others they are decidedly irritating. The 'behavior of a perforation,' under the employment of the artificial drum-membrane, varies greatly, as is illustrated by the following case: A patient wore for fourteen years a cotton-wool wad as an artificial drum-membrane, with beneficial result. The hearing became worse in spite of the cotton, and it was found that the perforation was closed. After it was re-opened the patient heard with the artificial drum-membrane

as well as before." The author concludes that no general rules can be laid down, but such treatment should be adopted in every particular case as will give the best result.

Grafting of Membrana Tympani.—Baratoux and Dubousquet-Laborderie⁷³₁₈₈₇ tried, like Reverdin, to cure defects in the skin by transplantation of small pieces of frog-skin. The pieces became attached in forty-eight hours, and lost the pigment on the tenth day. The frog-skin is especially fitted for this purpose on account of its thinness, the easy attachment, and the lack of hairs and sudorific glands. Baratoux used the frog-skin in a manner analogous to Berthold's application of the membrane of the egg-shell for closing perforations of the membrana tympani and for ulcerations in ozæna.

Foreign Bodies in the Ear.—William Cheatham, collaborator, reports a case of maggots in the ear. Fannie E., aged nine months, had been crying for twelve hours. Left ear had been bleeding for ten hours, for a while rather profusely; never had any ear trouble before. Ear thoroughly cleansed, and a small, nearly central, perforation of membrana tympani. Hot-water injections ordered, the first bringing out some blood and one maggot. The child cried no more, and has not had a particle of trouble with her ear since. Maggots in old suppurating ears are not very unusual. This little one's trouble was no doubt primarily the result of the presence of the maggot. Hole in the membrana tympani healed.

W. F. Cooper²⁸¹_{Apr.} found a tick, a species of acarus, attached to the membrana tympani of a child. The insect was dexterously removed with a small silver-wire loop placed around its head. For fear of injury to the membrane no traction was made, but the wire was left tightly drawn and intact until the insect was forced to let go.

Nervous Deafness.—In not a few cases improvement has followed the early subcutaneous administration of pilocarpin in labyrinthine disease. It must be used, if at all, at an early date, with due regard, however, to cardiac and other contra-indications. Lucac¹⁰⁰⁰ and Politzer¹²²³_{p.493} give it the highest rank in Ménière's complexus and begin the exhibition in the second or third week, when the more violent symptoms have subsided.

Corradi,³²⁸ Barr,² Schulte,⁶¹⁶ Hedinger,¹³³ and others have obtained favorable results in specific otitis interna, as have Schwartze, Kretschmann,³²⁸ and Moos³¹⁴_{v.17,H.1,2,'87} in the deafness

after diphtheritis faucium simplex. In scarlatinal diphtheria the success of Moos and O. Wolff has been equally great. In chronic labyrinthine affections we cannot expect as much, but there has been enough to justify further attempts. Old age demands extreme caution in administration, but does not constitute an absolute contra-indication, Corradi having obtained encouraging success in the case of a man eighty-eight years of age.

The dosage should be steadily increased and the injection repeated at intervals of from one to three days, according to the age and strength of the patient. Politzer uses four, eight, and ten drops of a 2 per cent. solution. Lucae gives one to five milligrammes ($\frac{1}{64}$ to $\frac{1}{8}$ of a grain) to children, and five to ten milligrammes ($\frac{1}{12}$ to $\frac{1}{6}$ of a grain) to adults—the latter amount only when the subject is robust.

TINNITUS AURIUM.

Treatment.—Lautenbach, of Philadelphia,⁴⁶²_{p. 875} gives his experience with nitroglycerine in the treatment of tinnitus aurium. He used the nitroglycerine in pill form, and in doses of one one-hundredth of a grain (0.00065 gramme). At first but one pill a day was given, generally in the morning. The amount was increased later, enough of the pills being given to diminish the tinnitus, or to cause headache. As many as six were given in a day, though two were usually found to produce a beneficial effect. Improvement was sometimes manifest within a day or two after beginning the remedy. In cases of long standing it was sometimes continued for a period varying from one to three months before a satisfactory result was obtained. Cases in which there was recurrence of the tinnitus seemed to yield more readily on resuming treatment than when the remedy was first administered. His conclusions are, after a fair trial of this remedy, that it is of value in certain cases of tinnitus aurium, especially those in which a cardiac lesion exists, functional or organic, and where there is little or no loss of hearing. Laurence Turnbull used nitroglycerine (glonoine) in tinnitus aurium in doses of one two-hundredth to one-fiftieth (0.000325 to 0.0013 gramme) increasing to one-tenth (0.00648 gramme) grain. He employed a 1 per cent. solution in absolute alcohol, giving one drop for a dose three times a day, unless it pro-

duced headache, restlessness, or depression. The dosage varies very much with different individuals, and we have known a patient to take very large doses while other patients suffered intense headache even after minute doses. The whole of the nitroglycerine is absorbed into the blood and nitrous acid is set free, causing dilatation of the vessels and lessening arterial tension. It also diminishes the resistance which the heart has to overcome in fatty degeneration and the weak heart of old persons, and in certain individuals it relieves the tinnitus aurium depending on these conditions. He agrees with Politzer⁶⁵⁰_{No. 4} that the remedy exerts but little influence in disease of the labyrinth in hereditary syphilis (where the iodide of potassium yields better results), or in panotitis following scarlatina or cerebrospinal meningitis, or, in fact, in any purulent inflammation. It is of the greatest utility in the removal of hæmorrhagic extravasation or recently organized lymph, especially in acute processes in the labyrinth. It has little or no influence in cases of long standing, although in a few instances benefit has resulted from its prolonged use for six or eight weeks.

INFLUENCE OF THE TELEPHONE UPON THE HEARING POWER.

Blake¹¹³⁵ says: "Under the condition of fatigue and relaxation the ear becomes peculiarly susceptible to the shock sustained by such sharp metallic sounds as are constantly apt to occur in the practical use of the telephone—sounds caused by sudden variation in current, and the breaking of connections; the danger to the ear, already impaired in its accommodative power by middle-ear disease, being both from the tax upon its enfeebled accommodation and from the sudden shock of sounds to the ear. The danger to the ear is always greater from such forms of receiving telephones as are attached to the head; a proper precaution should be taken that the telephone be held at a short distance from the ear, or at an angle of about forty-five degrees in front of it."

Later experiments have been made by Professor W. W. Jaques, who had arrived at very similar results. The author concludes by saying that these facts should be well borne in mind, especially since the telephone is an instrument the use of which will in the future increase rather than diminish, and since it is, moreover, not likely with our present knowledge to be essentially improved, since the principal gains in clearness and distinctness of

sound transmitted have come from improvements in the means of communication rather than from changes made in the receiving instrument itself, all attempts at dampening the high metallic overtones and improving the qualitative distinction between the consonant sounds by changing the structure of the receiving telephone having resulted in a corresponding loss of that intensity of which, as had been shown, there was so little to spare.

ALLOCHIRIA AUDITIVA.

At a recent meeting of the Paris Biological Society, Gellé¹⁶¹_{July} recorded a curious instance of allochiria. This affection, which is constituted by the preception of a sensation of contact in the opposite side to which the contact has been applied, is principally observed in tabetic patients and in those suffering from affections of the medulla. In the present case the patient suffered from Ménière's vertigo, with lesions in the middle ear, particularly in the left ear. Centripetal pressure applied to the left ear produced vertigo and pain. The patient, who was not tabetic, paralytic, or hysterical, recovered. Gellé describes the allochiria in this case as follows: Auscultation revealed a sonorous, vascular sound all along the right carotid artery. The patient did not discern this sound on the right side, but on the left side, where hyperæsthesia of the organ existed. The otoscope revealed no sound in this region. The manifest condition of hyperexcitability and hyperæsthesia of the left ear may account for the direction of the perception of sound; biauricular accommodation is effected by reflex action; the movements which produce it are perceived by the conscious faculty, and direct the passage of sound to the side where the maximum effort of hearing takes place. The process of adaptation in the hyperæsthetized side determines keener sensations, and by this means the perception of the sound is produced in the left side. Féré has observed similar phenomena in hysterical patients. When a muscle, situated in the anaesthetized side, is submitted to electric stimulation, these patients present muscular contractions on the paralyzed side. The patients are fully aware of the contractions, but not of the sensation which produces them. Brown-Séquard observed that the facts exposed by Gellé confirmed the theory which he has held for a long time, namely, the existence of single centres to each side of the body.

AURAL REFLEXES.

In the catalogue of reflex phenomena accompanying aural irritation are recently recorded: nausea and vomiting from impacted cerumen (Kynaston⁶ June 30 and J. Walker-Downie⁶ June 30); syncope from the application of nitric acid to the root of a polyp (Vogan⁶ July 27); impairment of vision recalling the disturbance of hearing observed by d'Arsonval after prolonged exposure of the retina to a powerful arc light, which is especially rich in the irritating ultra-violet rays (Gellé³ June 27); cough (J. Walker-Downie⁶ June 16); epileptiform seizures (Downie⁶ June 16 Boucheron¹³⁶ July Saurez de Mendoza¹³⁶ Aug and Emil Pins³²⁸ Bd. 28), and transient bilateral horizontal nystagmus (C. K. Kipp¹¹³⁵ v. 4).

Gellé³⁷ Sept. seeks to explain these phenomena by the hypothesis of an otospinal reflex centre in the cervical cord. His elaborate paper has been summarized as follows by C. H. Burnett⁵ Dec. :—

1. In binaural audition, the movements of accommodation, *i.e.*, the muscular action of the motors in the transmitting apparatus of the middle ear, are simultaneously and similarly set in action. 2. By the forces acting upon one ear similar impression is made on the other; for an experimentally produced movement in one ear provokes a similar active reflex in the other ear. 3. *E.g.*, if a vibrating tuning-fork is held in front of the free ear, while air is compressed by means of an air-bag arranged for the experiment connected with the opposite ear, the subject perceives a diminished sound of the fork due to the tension in its conducting parts which has been evoked reflexively, thus proving the existence of binaural reflexes. 4. This method of examination demonstrates the mobility of the stapes, the activity of the motors, and their alterations; it is, therefore, an important addition to aural semeiology. 5. When the ears are healthy and the hearing normal in both, the synergetic effect on the accommodation of the ear, disconnected with the apparatus of experiment, may be wanting; the cause in such cases is extra-aural; it is, in fact, the reflex centre in this instance which fails to unite the two organs and associate their movements. 6. Clinical experience shows that the disappearance of the aural reflex in such cases coincides with lesions in the cervical cord (five times in seven). 7. Clinically we may assume from the presence or the absence of these binaural reflexes the presence or absence of lesions in the cervical cord;

their disappearance renders diagnosis clear. 8. These reflexes do not appear to have any connection with pupillary reflexes; they remain when the aural have ceased, and *vice versâ*. Nevertheless, it seems shown by the fact that binaural reflexes are more easily influenced by hypertrophic cervical pachymeningitis. 9. Investigation of reflexes of binaural accommodation is related to the studies of affections of the medulla. 10. The centre of reflex movements of binaural accommodation is situated in the cervical medulla, as seen by its abolition in the course of maladies of this part of the spinal cord.

Mechanism of the Epileptiform Seizure.—Marshall Hall considered that two processes occur in the production of the fit. There is the excitation of a sensory nerve or direct central excitation, which gives rise, in the first place, to reflex spasm of the muscles of the neck, causing compression of the cervical veins, with consequent comatose symptoms; and, secondly, to a reflex tonic spasm of the muscles of the larynx, closing the rima glottidis (laryngismus), and causing asphyxia, with consequent convulsions. In other words, the condition of unconsciousness is ascribed to venous engorgement, and the convulsions to general asphyxia.

Adolph Kussmaul and Adolph Tenner, in their investigations concerning the pathology of epilepsy, showed that occlusion of the larynx alone is capable of producing coma and convulsions, and consequently they refuse to accept the first portion of Marshall Hall's theory.

Taking the method of producing an "ear cough" given above as granted, we are justified in considering those cases where epileptiform seizures were the most prominent symptoms as being due to aural irritation, and produced in the same manner as the so-called "ear-cough." The large polypus, accompanied by copious purulent secretion, formed the peripheral irritant. This irritation was conveyed to the nerve-centres in the same way as before described, but in place of the expiratory muscles contracting in response to the supposed laryngeal irritation, contraction-spasm of the muscles of the glottis occurs, producing a condition of laryngismus resulting in asphyxia and consequent convulsions. Such a complication of aural polypus is rare; but so also are cases of cough from aural irritation, and yet every one brought into contact with large numbers of aural patients has met with a greater or

lesser number of such. For the determining cause of the production of the more serious symptoms we must look to the previous general state of the patient's health and to the family history. As one result of the experiments in the production of artificial epilepsy in the guinea-pig carried out by Brown-Séquard, and later by C. Westphal, it was shown that the offspring of those animals in whom epilepsy was thus induced may develop the epileptic condition. Clifford Allbutt, in reviewing Livelings' work on "Megrim, Sick Headache, and Some Allied Disorders," mentions a case of laryngeal epilepsy where the larynx on examination was found to be thoroughly healthy; but the patient—a big, strong man—had been the subject of megrim in younger life, and came of a decidedly neurotic stock. Patients, then, in whom epilepsy occurs as a result of peripheral irritation, may be the offspring of epileptics or those suffering from some minor, though it may be well-marked, neurosis; although in neither case was he able to trace any marked neurotic tendency, either in the patients or their near relatives.

Suarez de Mendoza ¹³⁶_{Aug.} reports a case of a man of twenty-eight years who had been an epileptic for twenty years, who consulted him concerning a discharge from one of his ears, which had come on immediately after an attack of typhoid fever in his eleventh year and had always been considered a sequel of the same. On examining the ear it was observed that there was an enormous, wine-red polypoid growth which extended to the base of the tragus. Touching this tumor with his probe, the physician was astonished to see his patient fall into an epileptic fit, and when the crisis passed off he was informed by the patient that this result always followed a touch of the tumor. The physician removed the tumor by means of a snare, a delicate operation, by reason of the causes just stated. A good many séances were necessary to accomplish the entire removal of the mass and the cauterization of the pedicle, but at the end of twenty days the man was discharged cured of the otorrhœa and of the epileptiform seizures. The result seems to have been permanent, as the patient remained for some time under observation and there was no return of the malady. The perforation of the membrana tympani, however, persisted.

Schmiegelow discusses the reflex neuroses occurring in the

middle ear. Urbantschitsch's investigations on the relation of the sense of vision were repeated by him experimentally, but could not be confirmed. The author mentions the neuralgias of the fifth nerve in inflammations of the middle ear, the reciprocal action of both ears, the effects upon the perception of taste and smell, and the reflex impulses transferred to the motary apparatus. In a case of formation of polypus with impeded efflux of secretions, existed attacks of anxiety, neuralgia, and vertigo. Cure after the removal of the polypus. According to the experiments, Schmiegelow considers the forced movements and the attacks of vertigo, in opposition to Baginsky's and Lucae's views, as the reflex neuroses originating from the vestibular branches of the auditory nerve. The impulse is caused by pressure on the labyrinth. Schmiegelow's second case serves as a proof that marked psychosis can be cured by the removal of an aural polypus.

In addition to these subjective phenomena by reflex mechanism, a notable visceral disturbance in association with an error in aural function has recently been observed, viz.: albuminuria and deafness. Gellé³_{No. 12} reports deafness, sudden, profound, and permanent, without discoverable lesion of the ear, in a case of mediastinal tumor compressing the recurrent laryngeal. The urine contained a small amount of albumen and the patient died eighteen months thereafter of chronic Bright's disease. Gellé attributes the renal and aural phenomena to a bulbar lesion consecutive upon the irritation of the vagus, and recalls in this connection the experiments of Wiett and Laborde, in which a stretching of the vagus produced a hæmorrhagic and suppurative otitis, although in his case no lesion of the ear was to be found. Henriot,³⁹²_{Aug. 1} from a case in which diabetes mellitus existed in a patient with a tumor in the course of the vagus, believes such to be causal of diabetes mellitus also.

AURAL VERTIGO.

The relation of the semicircular canals to Ménière's phenomena has again become the ground of controversy. Baginsky⁴_{Nov. 12} questions the validity of the prevailing doctrines, and seeks to eliminate from the Goltz and Flourens experiments the concomitant variations due to cerebral involvement in the trauma. The residual phenomena do not include that of vertigo. It will be of advantage to follow his argument in detail, and it is here repro-

duced largely in his own language. The complexus of symptoms presents itself most characteristically in the so-called "Ménière's Disease."

The affection generally presents itself thus: A hitherto healthy individual is suddenly seized with tinnitus, intermittent or continuous, with more or less disturbance of audition, and generally vertigo, nausea, vomiting, pallor, profuse perspiration, and subjective anxiety. He is often compelled to lie on the ground, and must close his eyes to shut out the objective whirl and prevent the aggravation of vertigo. These symptoms recur at short intervals, or do not remit at all. Examination of the membrana tympanum and tuba Eustachii gives only negative results. In the classic case of Ménière, a young girl, having during menstruation exposed herself to cold, was suddenly seized with vomiting, vertigo, and bilateral deafness, and died on the fifth day. Autopsy revealed no changes in brain or cord, but the semicircular canals were filled with a "*matière rouge, plastique, sorte d'exudation sanguine dont on apercevait à peine quelques traces dans le vestibule et qui n'existait pas dans le limaçon.*" The semicircular canals alone and no other part of the labyrinth—and this is the essential point in Ménière's argument—presented upon the minutest examination any abnormality, and from the presence of this "*lymphe plastique, rougeâtre, remplaçant le liquide de Contugno,*" he placed the anatomical site of his newly observed symptom-complex in the semicircular canals.

The validity of his induction seems at first beyond attack, but there is no theme upon which there has been so many minds. The neuropathologists sin most in lack of precision and confound simple aural vertigo with the complexus of symptoms described above, and to which otology confines the term of Ménière's disease. Some transfer the seat of lesion to the middle ear, while Brunner maintains that in one of the cases observed by him it was the question of a "*vasomotor neurosis of the labyrinthine vessels,*" and suggests the name "*Morbus Ménière sympathicus s. vasomotorius;*" others lean to the hypothesis (in isolated cases, at least) of a circumscribed cerebral lesion with secondary labyrinthine changes.

In 1828 Flourens observed in pigeons, after unilateral lesion of the semicircular canals, a temporary, pendulum-like motion of

the head toward the injured side. In cases of bilateral lesion of the horizontal canals the motion was in a vertical direction. After lesion of one horizontal canal the bird would turn completely in the direction of injury, and after that of the vertical canals it would frequently fall from before backward. Flight was disturbed in all cases after bilateral lesions, and even upon level ground the pigeons could move only with difficulty. Audition was maintained according to his observation. Flourens reasoned that the acoustic nerve serves only the function of audition, and that as such motor disturbances could not be explained by injury to this nerve we could expect only disturbance of hearing, concluding, therefore, that the auditory nerve consists of two essentially different elements—the cochlearis, after whose destruction deafness regularly occurs and which is the nerve of hearing proper, and the *nervus vestibuli*, which is distributed to the labyrinth and semicircular canals, and after whose destruction all the observed motor disturbances after injury to the canals arise. Flourens has not recorded the variety and extent of the lesions with sufficient precision to fix their experimental value. Harless, Czermak, Brown-Séquard, and Vulpian accepted the conclusions of Flourens, but Goltz has placed the question upon a new basis. He observed in two pigeons, after destruction of the canals, revolution of the head one hundred and eighty degrees. The occiput was placed upon the ground, with the beak upward, and the body would revolve around this as a centre, or the bird would in this position move backward. The power of flight was gone. Goltz believed that the abnormal position of the head alone is sufficient cause for the disturbed movements of the body, inasmuch as the same movements were observed in birds without lesion of the canals, but whose heads were simply fixed in the same abnormal position, and that the wrong position of the latter is explained in the former case by the missing canals. He therefore propounds the thesis that the canals form an apparatus for maintaining equilibrium, and that they are, so to speak, the organs of the sense of equilibrium for the head and indirectly for the whole body. This view is adopted by Mach, Brunner, Crum-Brown, and others.

Cyon considers the canals as the peripheral organs of the sense of extension, the respective positions of the canals corresponding to the three dimensions of space. Tempting as is the hypothesis

of Goltz, inasmuch as it seems to explain the functional significance of the semicircular canals, subsequent investigations have not confirmed it. Particularly has Böttcher proved by careful examination in pigeons that the revolution of the head, attributed by Goltz to lesion of the canals, is in consequence of a brain complication from an error in technique, which is inevitable if the canals are removed by chisel after the manner of Goltz; and that the consequent symptoms had their origin in injury to the brain, and in particular of the cerebral peduncles. It is surprising that his labor did not receive attention, and, although it should impose great caution in the designation of the canals as peripheral organs of the sense of extension, the hypothesis of Goltz has been extensively adopted, especially by otologists. Baginsky's experiments upon pigeons by section of the canals have led to results agreeing with those of Böttcher—that the cause for the revolution of the head is a lesion of the brain, which Goltz had believed himself to have excluded in his experiments—and with this the conclusions of Goltz fall to the ground. The next question is whether the interpretation which Flourens placed upon his experiments is a proper one. One point in particular seemed to connect the canals with the sense of equilibrium, viz.: that the direction of the disturbance in equilibrium seemed in Flourens' observation to stand in relation to the direction of the injured canal. Those of Böttcher and of Baginsky, however, have not been confirmatory of this; on the contrary, they tend to show that disturbances of equilibrium do not correspond to the direction of the injured canals, and that in the pendulum motions of the head many exceptions are found. Moreover, the whole canal apparatus communicates through the wide aqueductus vestibuli with the epicerebral space, so that in the opening of either canal the cranial cavity is opened at the same time, and with the consequent loss of cerebrospinal fluid irritation of surrounding parts of the brain may ensue. This cerebral complication renders Flourens' conclusion in regard to equilibrium and Goltz's corollary concerning the sense of space in the canals untenable. Furthermore, it has been *à priori* argued that if there is no sense of space situated in the canals, the disturbances after lesion must have origin either in a paralysis of the nerve or (according to some) in an irritation of the same. In an exhaustive work it could be proved that neither view holds good,

that, on the contrary, it is in the variety of cerebral trauma inevitably complicating any lesion of the canals by the raw force of Goltz's operation that we are to find explanation of the motor phenomena evoked. Besides, early embryological identity of the canal apparatus with the cochleæ is an *à priori* warrant for the inference that even after a later differentiation the canals are still to be considered as an integral part of the sound-receiving apparatus. It is possible (as Grünhagen has shown) that the canals with the adjoining ampullæ can be considered as a peripheral ganglionic organ for the transmission of acoustic reflexes to the motor channels controlling the movements of the head, etc., for which there is an analogy in the case of other sensory nerves. Such, however, remains with the investiganda.

It would be a great mistake to apply the experiments on pigeons, without further consideration, to man. The structure of the organ of hearing in these animals is an altogether different one. The normal movements of the head and the body are especially unlike those of the mammals and of man, so that in the disturbances of the same little comparison can be made, and especially is this true of animals which walk sometimes on two and sometimes on four extremities, as with the quadrumana. In such the direction of the canal must change with the positions of the body, the horizontal canals becoming vertical, and *vice versa*. If, therefore, the different canals had different physiological functions, we must imagine that the canals change constantly in function and are vicarious for one another. The dilemmas of such an hypothesis cannot be solved by deduction.

The clinical argument against it is still more convincing, although the recorded cases of typical Ménière's disease are not numerous enough to furnish the desired material. One consideration is of high importance, viz.: In Ménière's disease the loss of hearing (generally bilateral, sudden, and complete) is a constant and essential symptom, while in uncomplicated experimental section of the semicircular canals the hearing is invariably preserved. If the anatomical seat of the disease were in the canal alone and the latter served only the sense of extension, we could expect a loss of hearing. The remaining disturbances might exist, and the vertigo could be explained, but deafness and tinnitus could not be essential to the affection. Clinical experience supports the view

either that the canals are concerned in the function of hearing, or, if this is not the case, that the cochlea must be affected at the same time. Baginsky concludes, therefore, that the cause of Ménière's complexus of symptoms cannot be due to disease of the canals alone. Whether labyrinthine involvement is constant in all cases of Ménière's complexus is a question as yet unanswered by the material at hand. Neither irritation of the canal nor paralysis of the same is alone sufficient to produce the disease. The cases published by Ménière and by Lucae show, on the contrary, that severe lesions of the canals can occur without Ménière's symptoms. In Lucae's case, a boy of three and a half years, without history of vertigo, became suddenly deaf on both sides, with a prodromal tinnitus, and exhibited post-mortem a hæmorrhage in each labyrinth and in the canals analogous to that in the case reported by Ménière. The tinnitus sufficiently indicated irritation followed by extinction of the nerve. Furthermore, the complete experimental extirpation of the canals is not followed by Ménière's symptoms.

Politzer, Voltolini, and others have recorded cases in which, through trauma of the skull, the labyrinth has been considerably injured. Many of these cases have shown symptoms analogous to those of Ménière's disease, but the extent of cerebral complication was in all cases hard to define, as most died of meningitis. Traumatic affection of the labyrinth does generally cause Ménière's symptoms. Inflammations of the labyrinth throw little light upon the subject, the methods of investigation being very obscure. The speculum and tuning-fork are altogether insufficient. Cases of cerebrospinal meningitis show isolated symptoms of Ménière's complexus, but such belong to several affections. Bezold collects forty-six cases of necrosis of the labyrinth (including five observed by himself) and finds vertigo unmentioned in twenty-three of the cases. In seven of the remaining cases the patients were too young for accurate observation. Of forty-six cases, therefore, of necrosis of the labyrinth only twelve showed symptoms of vertigo.

Conclusions: From a clinical stand-point there can be no connection between the symptom of vertigo and affection of the labyrinth: on the contrary, diseases of the labyrinth are *not* the cause of the vertigo. In caries and necrosis of the labyrinth vertigo may exist, but it is not present in the majority of cases. Complications, generally of the brain, must arise with a vertigo varying

with the site and extent of the cerebral involvement. The fact that such occurs, if at all, about the time of exfoliation of the sequestrum is significant. We have more likely to do with meningeal irritation. Ménière's symptoms may be observed in hysteria and hysterocpilepsy, as a result of functional disturbance of the brain, as well as in syphilis and tabes dorsalis. Here acute forms have generally to be dealt with. In the typical complexus the symptoms are acute, apoplectiform, and generally introduced by unconsciousness. In cerebral disease there is sufficient explanation of the symptoms. The auditory nerve can be affected as easily in the floor of the fourth ventricle as peripherally, and, according to the extension and locality of the lesion, unilateral or bilateral disturbances of audition may be the result. With regard to the cases of syphilis and tabes in which Ménière's symptoms are observed, it is difficult in many instances to define the connection clearly, the more so since in these affections we observe progressive deafness without Ménière's symptoms. Finally, aural vertigo may exist in the most varied affections; the causal connection of which with cerebral diseases is highly probable, while its dependence upon diseases of the labyrinth is only so far proved as these latter are connected with lesions of the brain. Although in cases of syphilis and tabes pathological and anatomical facts are wanting, the aural vertigo may be considered independent of lesion of the labyrinth, particularly of the canals, and this the more so in diseases characterized by error in conduction, in very few of which Ménière's symptoms are observed. Impacted cerumen or diseases of the Eustachian tube may evoke Ménière's symptoms, but only by reflex action through the tympanic plexus.

1. Since, at present, the name "*morbus Ménière*" describes no special disease, but only a complexus of symptoms, it would be better to speak of "vertigo Ménière" (V. M.).

2. Only such conditions should be classified under the head of vertigo Ménière in which the attacks of dizziness occur suddenly, without known cause, with distinct intermissions, which are ordinarily quite lengthy, without fever, with more or less intense subjective noises ushering in the attack, and with a rapid or only gradually occurring deafness. This excludes the dizziness in mechanical interference with the middle ear, as well as the constant dizziness of acute labyrinthine inflammation.

3. That vertigo Ménière can be caused by pathological processes in the brain (especially in the cerebellum) cannot be doubted. There are no absolutely certain signs for differential diagnosis; still, a confounding of the two will occur very seldom, since disturbances of hearing are only exceptionally present in lesions of the cerebellum (and also of the crura cerebelli), and if they are present they are only as a result of accidental pressure upon some of the adjacent fibres of the acoustic nerve.

4. Ordinarily vertigo Ménière has its origin in some pathological condition of the labyrinth (semicircular canals), primary or secondary.

5. In the interest of the nosological arrangement of vertigo Ménière, the separation of the severe cases—those with sudden or rapidly acquired deafness—from the mild ones seems indicated, since the two seem dependent upon different anatomico-pathological bases. On the same ground, the vertigo Ménière following an otorrhœa of many years' standing could be described separately as "vertigo Ménière post otorrhœam."

6. Some cases of the *severe* form may be dependent upon hæmorrhage into the labyrinth; some of the *mild* forms to vasomotor neurosis.

7. However, we believe that too much stress is laid on the part which hæmorrhage plays in explaining the vertigo Ménière, and we would express our opinion that a large number of cases depend upon a pathological condition of blood pressure in the labyrinth (analogous to glaucoma), *and that a retarding or stopping of the efferent channels for the perilymph and the endolymph is a very important factor in this affection.*

8. In favor of a vasomotor (neurotic) origin of vertigo Ménière there seems to us to be (*a*) the "aura vertiginosa" preceding the attack; (*b*) slight (even absent) functional disturbance appearing only gradually; (*c*) a certain regularity and frequency of the attack; (*d*) the effect of quinine in cutting short, or at least moderating, the attacks (also galvanization of the cervical sympathetic).

9. From the experience of ophthalmologists, as well as from all we know as to the action of large doses of quinine, there is no doubt but that they produce a high degree of ischæmia of the retina as well as of the labyrinth. In this way may be explained

the favorable influence of large doses of quinine in our own and in similar observations, as well as in the Giraud case (Charcot's).

Charles H. Burnett, of Philadelphia, collaborator,¹¹²⁵ has succeeded in entirely relieving a case of aural vertigo (Ménière's disease) and excessive tinnitus of several years' duration in the left ear of a woman, thirty-eight years old, by excision of the membrana tympani, the malleus, and the incus. The malleus had become adherent to the promontory. The operation known as Sexton's operation was performed with the patient under ether, the illumination of the ear being accomplished by means of an electric lamp arranged to be supported on the forehead, like the reflecting mirrors. The current is supplied by a portable storage battery weighing twenty-five pounds.

Nystagmus Occurring in Connection with Purulent Otitis Media.—Charles J. Kipp¹¹²⁵ records the observation in three cases of oscillatory pneumonia accompanying the exacerbations of inflammation in the middle ear. The first case, that of a man, twenty-eight years of age, with impaired hearing and an otorrhœa of seven years' standing, presented the symptoms of mastoid inflammation, together with still greater loss of hearing upon the left side. Rinné, by c, c^1, c^2, c^3, c^4 , B C = A C, Weber, from vertex only, undecisive; the watch inaudible. Loud perforation sound by the Valsalvian experiment. The integument of the external auditory canal was so prolapsed as to conceal the membrane. The mastoid was sensitive to deep pressure, and the neighboring lymphatic was swollen and tender. The right ear presented only a dry perforation sound and reaction to the tuning-fork, as in the left. Incision into the prolapsed portion of the external canal brought no pus, but a bloody serum, and the mastoid pneumonia subsided. Ten days after, however, there was a return of headache and an objective vertigo, apparent motion being from left to right. In looking at distant objects the vertigo increased in intensity, and at the same time he complained of diplopia. Both eyeballs were observed to oscillate rapidly in the horizontal plane, and to be uninfluenced in this regard by fixation of near or distant objects. Nor could diplopia be demonstrated. There was no optic neuritis, nor were there movements of the head analogous to the nystagmus. Syringing the ear greatly increased the vertigo, and sometimes produced a jerk of the head toward the affected

side. These phenomena continued with more or less severity for about ten days, disappearing under appropriate treatment. The diplopia was crossed, and not constant. A furuncle in the external canal and a temporary loss of smell, with no abnormal appearance of the nasal mucosum to account for it, appeared as complications. In commenting upon this remarkable case Dr. Kipp remarked:—

“The occurrence of oscillatory movements of the eyeballs as the result of purulent inflammation of the middle ear is doubtless a very rare event. The case here reported is the only one seen in more than twenty thousand cases of ear disease, and a somewhat extended search for similar cases in the literature of eye and ear affections has resulted in the finding of four cases. It is very probable, however, that other cases have been overlooked.”

In connection with Ménière's group of symptoms, nystagmus has been observed by J. Hughlings-Jackson,⁴⁷ Jacobson,³²⁸ and Gruber.¹²²³ Moos⁶⁶ reports a case of mimic facial convulsions, complicated with nystagmus and vertigo, and thinks that in this case he probably had to deal with a spasm of the stapedius muscle which accompanied the tic convulsif, and was caused by a labyrinthine irritation from diminished tension. The irritation was transmitted on the one hand to the cerebellum, on the other to the centres of innervation of the ocular muscles, causing occurrence of the facial convulsions, together with vertigo and nystagmus.

Instances in which nystagmus could be produced by syringing of the middle ear, and also by other forms of mechanical irritation, have been observed by Schwabach,³⁸⁵ J. Hughlings-Jackson,¹²²⁴ Bürkner,³²⁸ and Pflüger.⁷⁵³

Pooley's case¹ was a blacksmith, forty-three years old, who had for some time presented various indefinite symptoms on the part of the nervous system, the eyes, and ears. He had a typical attack of Ménière's disease, and remained completely deaf and dizzy until his death. Pooley found bilateral neuroretinitis with all signs of retinitis albuminurica, although the most careful and repeated examination of the urine did not reveal either casts or albumen. The autopsy showed, however, that both kidneys were hyperæmic, and that one was larger than the other. The brain was extremely soft. No tumor or extravasation were found. Pooley is inclined to accept albuminuria as the cause of the trouble, in spite of the lack of the usual appearances which establish the diagnosis.

OTITIS INTERNA.

Primary Syphilitic Otitis Interna.—Gradenigo³²⁸ reports an interesting case of primary otitis interna e lue congenita. The patient, a girl of fifteen, deaf-mute, with otorrhœa A. S., and without history of inco-ordination or other motor error, died of phthisis pulmonum. The autopsy disclosed integrity of the intracranial structures. The tympani presented respectively on the left an otitis purulenta, and on the right no abnormality other than in the conformation of the promontory; but in the internal ear, on both sides the membranous labyrinth had given place to bony and cicatricial tissues and of the semicircular canals every vestige was gone. The bony vestibules were narrowed, and the remaining space was filled with old fibrous tissue. The scalæ cochleæ were lost in an endostosis at maximum toward the base. The windows were blocked with dense fibrous tissue, especially upon the side of the otorrhœa. Gradenigo's doctrine is that there is a primary otitis interna which rests indirectly upon a specific basis, but which, like the interstitial keratitis often accompanying it, or alternating in exacerbations with it, as is more common in our observations, presents neither histologically nor clinically any marks of differentiation from a simple inflammation having the phenomena of hyperæmic proliferation and eventually either suppuration and necrosis, or bony and connective-tissue hyperplasia. The morbid process proceeds with the greatest energy in the vestibules, semicircular canals, and the gyrus basilaris cochleæ. The middle ear may become involved by contiguity, and may suffer a suppurative or plastic inflammation. The data in diagnosis are the dyscrasia as revealed elsewhere in the organism, suddenness of the onset, bilateral involvement, and the severity of its course without marked systemic disturbance; while in the case of a non-specific otitis interna there are tinnitus, diminished audition, especially in the upper scale, and disturbance of equilibrium. Whether there occurs a bilateral otitis interna without syphilis is an open question.

Regarding the complexus of symptoms to which Voltolini applies the term "acute otitis labyrinthica," Gradenigo does not deem the same sufficiently constant to constitute a disease, and insists that the recorded cases depend either upon a specific otitis interna or are secondary to meningitis or otitis media (panotitis).

The deafness in children, accompanied by a short febrile movement and without tympanic or cerebral symptoms (Voltolini's disease), cannot in any way be distinguished from otitis interna e lue congenita in an adult.

Baratoux⁴⁶²_{p.859} notes the changes in the internal ear in hereditary syphilis, and urges the same diagnostic investigations as Tilley.

THE RELATION OF AURAL TO GENERAL DISEASES.

Cerebrospinal Meningitis.—The autopsies of Steinbrügge⁶⁶_{v.17,p.82} and Habermann, in cases of cerebrospinal fever where there had developed deafness *intra vitam*, revealed destructive tissue changes in the internal ear. The processes are, according to Steinbrügge, suppuration and necrosis—the latter playing the principal part. The probable cause is a direct action of the morbid virus upon the capillaries of the periosteum—and pre-eminently in the semicircular canals—producing vascular stasis and thrombosis in this membrane, with consequent necrosis of the structures thereto attached. Thus in one of Steinbrügge's cases the posterior and superior canals, where the destruction had been the greatest, were each entirely denuded of periosteum, and the lumen was filled with broken-down lymph and the *débris* of necrosing bone, vessels and other histological elements. The membranous canals were loosened from their osseous attachments and lay compressed or were broken down beyond recognition. Similar alterations, although not so extensive, were found in the sacculus and utriculus. In addition to this necrotic process, another factor is the suppurative inflammation, in which the pus plays also a mechanical *rôle*. When there is not an early death from the cerebral disease, there begins with this necrosis a process of new-formation—connective-tissue hyperplasia, and eventually enostosis abridging or even obliterating the cavities of the internal ear. In what manner does microbial invasion of the internal ear from the cranial cavity take place? There is free communication between the perilymph and cerebrospinal fluid through the lamina cerebrosa and the aquæductus cochleæ (Habermann). Steinbrügge in one case found the internal auditory canal and entrance of the canalis cochlearis filled with pus, and Habermann found a plug of pus in the inferior portion of the aqueduct, while nearer the brain appeared granulation tissue. Clinically, it should be especially noted that in sporadic

cerebrospinal fever the temperature may, in spite of suppurative meningitis and marked labyrinthine destruction, remain at or near the normal after a temporary and, perhaps, unnoted elevation, and give no indication of approaching recovery, relapse, or exitus lethalis.

Treatment.—Moos¹²²⁵_{p.45} goes extensively into the Charcot quinine treatment, regarding it as probable that the treatment—the many favorable results of which he does not question, having even observed it himself in one case—allays the dizziness through the antiphlogistic qualities of the quinine, and not through the destruction of the acoustic nerve. The fact that the disturbances of motion cease with the occurrence of total deafness he regards as very exceptional. Even if this were the case, it would be questionable, according to him, whether a destruction of the function of the acoustic nerve would be justifiable—certainly not without the consent of the patient.

Hobby, of Iowa,⁴⁶²_{p.662} in referring to *cerebrospinal fever* as a cause of deafness, comes to the following conclusions: (1) cerebrospinal fever is prevalent throughout the United States and is a constant factor in the production of disease; (2) upon the surface it appears equal in importance as a cause for total deafness with scarlet fever; (3) when proper weight is given to the report of cases of deaf-mutism, cerebrospinal fever is the disease above all others producing total deafness, which the non-professional mind would class as “Fever, Congenital or Unknown;” (4) from reasons, some of which are specified above, and others which are apparent to any physician who has studied the defective classes, it is probable that not more than 10 per cent. of the cases of deaf-mutism are actually congenital; (5) with this assumption, there appears upon the face of the reports 35 per cent. of cases of total deafness for which no rational explanation is offered; (6) the greater part of this 35 per cent. result from intracranial causes, including under intracranial disease affections of the labyrinth; (7) it is important that much thorough investigation of cerebrospinal fever be made, and especially of its relation to deaf-mutism, with the hope that in the light of more perfect knowledge of its cause and methods of dissemination the production of deafness from this cause may be diminished as much as the sources of blindness were cut off by vaccination.

Tuberculosis of the Ear.—Habermann⁴⁶⁵_{Bd.9,H.2,3} has made an exhaustive histological study of eight cases. The ear was not alone involved, or primarily—pulmonary and intestinal lesions being constant, and in only one case were the liver, kidneys, and spleen intact. The larynx was attacked in two cases, and the tonsils in one. Tuberculosis was noted in the only two nasopharyngeal cavities examined. The tympanum exhibited various stages of the process. In two cases there was an acute tuberculosis with diffused infiltration and bacilli without number, but with few giant cells. In another, caseous degeneration predominated. In three other cases where the progress had been more slow were found numerous miliary tubercles with giant cells and few bacilli. These three cases were accompanied by a superficial caries of the ossicles, the fenestra and Fallopian canal, and a deep ulceration of the mucosum—especially in the region of the promontory and stirrup. The membrana tympani suffered most along its inferior circumference and around the attachment of the ossicles. The lesions seemed to begin in the mucosum and extend to the cutaneous layer, the bacilli propagating themselves through the interstices of the membrana propria. In extreme cases this membrane broke down, and the whole membrana tympani disappeared. In other cases, restoration *ad integrum* took place. Perforation was from without inward. In the mastoids there was an early infiltration of the mucosum with miliary tubercles. The latter penetrated the bone and determined a superficial ulceration and eventually a more profound destruction. The tubes were generally but slightly involved—if at all, in the bony portion, and in a manner analogous to that in the tympanum. The cartilaginous part was generally inflamed, but in one case only did it present tuberculosis. The bacilli seemed to have penetrated the labyrinth by rupture of its bony capsule. The perilymphatic space was at first invaded; then, after the breaking down of its wall, the endolymphatic space. According to the energy of the morbid process or the resisting powers of the patient, it was sometimes destruction and sometimes caseation which predominated. Recovery is not altogether impossible, for Schwartze has reported elsewhere a case. Habermann also reports two in which he found granulation tissue surrounding the miliary foci, and a third in which there was the formation of cicatricial tissue and bone repair. The greatest obstacle to recovery is the

persistence of a tuberculous otitis media, which is an unending source of new inoculations. The tuberculosis propagates itself along the canals which place the internal ear in communication with the cranium—the aquæductus vestibuli and aquæductus cochleæ—and then by the nerve-trunks to the internal auditory meatus. This alteration in the nerves is slow. In one case the cochlea was profoundly involved, while the nervus cochlearis remained intact.

Leukæmia and Deafness.—A man of twenty-five years, in the course of a myelogenous leukæmia and with a long-standing otitis media purulenta, and the history of repeated attacks of vertigo, suffered two weeks before death from sudden deafness in the left ear with persistent tinnitus. An autopsy by Steinbrügge⁶⁶_{v.37,p.59} disclosed in the tympanum old fibrous adhesions in the recesses of the fenestræ, and in the internal ear hæmorrhagic areas involving the neurolemma of the nerves in the internal auditory canal, in the neighborhood of the nervus sacculi and the proximal end of the nervus facialis. The scalæ cochleæ were for the most part filled with blood, as was the ductus cochlearis—the extravasations principally occupying the region of the stria vascularis and lacerating or hiding the organ of Corti. In the sacculus there had been copious hæmorrhages. In the utriculus there had been some proliferation and it was filled with a granular mass. The nerve terminals in the vestibules were well preserved. The membranous semicircular canals were intact, but toward the exterior were inclosed in new-formed osseous tissue—probably unconnected with the leukæmia.

Ménière¹³⁶_{Jan.} reports two additional cases of unilateral and two of bilateral deafness following the mumps. One was a boy, twelve years of age, with bilateral mumps, in whom complete deafness appeared on the seventh day in the left ear. The second was a girl, eight years of age, with bilateral mumps, in whom the right ear became totally deaf on the ninth day. The third was a boy, fourteen years of age, with bilateral mumps, who became totally deaf in both ears on the fourth day. The fourth was a boy, five years old, who had bilateral parotitis and became totally deaf in both ears on the seventh day. All these patients recovered from the parotitis, but remained totally deaf. While admitting the possibility of an affection of the labyrinth, Ménière thinks the

most frequent cause of the deafness is a meningeal hyperæmia leading to grave lesions of the auditory nerve in its origin like its course.

Invasion of the Labyrinth by Microbes in the Course of Measles.—Within a year from the appearance of Moos' ⁶⁶_{v.17, No.1} monograph upon invasion of the labyrinth in diphtheria, there follows a similar work ³⁴⁴_{Bd.16, H.2} upon bacterial invasion of the labyrinth in the course of measles.

The subjects of investigation in the latter work were the temporal bones of a child, three years of age, who died of a catarrhal pneumonia seven days after admission to the hospital with measles. The submucosum of the labyrinthine wall—serving as periosteum—presented in places insular changes, such as Steinbrügge and Moos had already described in tertiary syphilis, and which Rindfleisch has termed syphiloma ossium. But the vessels were for a great part thrombosed and showed fatty degeneration of the endothelium. In other places the mucosum presented hæmorrhagic infiltration. The histological changes in the labyrinth are almost identical with those observed by Moos in the analogous diphtheritic complication, but are distinguished by the greater variety of the products of the retrograde metamorphosis of the lymphatic cells themselves, and of the histological elements of the regions where they are accumulated. These changes are partly brought about by mechanical momenta (coagulation of lymph, aggregation of lymph-cells, etc.), and partly by the general thrombosis and other vascular changes. The general thrombosis is explained by the changes in the vascular endothelium. This tendency to extensive destruction of tissues which characterizes the poison of measles is, according to Moos, perhaps less the direct effect of the virus than of the vascular changes, which are more extensive than in diphtheria. For the bacteriological examination the methods of Manfredi and Gramm and the method of Gabbett for coloring the bacilli of tubercle were used. In one bone (the right) micro-organisms were found only in the medullary spaces and in the nerve detritus between the layers of the lamina ossia. In the other petrous bone (the left) they were found in the most varied territories. The microbes observed were streptococci of round form, which the author groups with those observed by Cornil, Babès, and Manfredi in measles, the latter falling into the category of microbes

which (to accept Kleb's dictum as a working hypothesis) are common to all exanthemata.

Nevertheless, Moos does not consider the streptococcus observed to be specific of measles, but rather (as in the case of diphtheria) accidental, although he does hold it responsible for the pathological changes which take place in the labyrinthine invasion. Between the streptococcus observed in diphtheria and that in measles no morphological distinction can as yet be made, but biologically they can be differentiated, in that in diphtheria a process of new-formation proceeds with the necrosis, while in measles there is necrosis alone and not a sign of new-formation. In measles the conditions are more unfavorable to microbial invasion of the labyrinth than in diphtheria, and this dire complication is consequently less frequent than in the latter. The clinical picture of the three cases on record—two of Moos and one of Rohrer—with the sudden complete and permanent deafness and the continued inco-ordination of gait, give cause for congratulation that the affection is rare.

DISEASES OF THE MASTOID CELLS.

Cozzolino⁶²¹_{July} reports five cases in which he opened the mastoid; six cases of paramastoiditis, with perimastoidal abscess, in which he kept off the osseous lesion by means of Wilde's incision, and four cases cured by antiseptic measures and cleanliness of the middle ear.

De Rossi⁴⁸⁴_{v. 4, No. 2} is of opinion that the most common origin of abscesses of the mastoid apophysis is from a purulent periphlebitis of the transverse sinus, which finds its way through the foramen lacerus posterior and along the nervous-vascular bundle, exciting embolic processes through the conjunctive perivascular and perineuritic tissue and producing, first, caries of the mastoid wall, and then periphlebitis of the sinus, or this last, directly, while the osseous wall remains untainted.

Supported by the anatomical studies of two cases, he was able to make the clinical diagnosis in a third, and reach a complete recovery by perforation of the mastoid, as far as the sinus sigmoideus. He recommends "in cases in which the symptoms of abscess in and out of the skull are present, and the history is in favor of purulent inflammation of the middle ear, to seek the pus even in the sulcus sigmoideus." (Report of Massei, corresponding editor, Naples.)

Acute primary inflammation of the mastoid cells is extremely rare and imperfectly understood. Fulton, of Minnesota,⁴⁶²_{p.825} states that "a very characteristic symptom of this trouble is a feeling of fullness and pressure about the mastoid region. The patients place their hands there, feeling a need of support and obtaining some relief from the pressure. But, even with the most painstaking care, this trouble cannot always be diagnosed with certainty. Often it is thought to be neuralgia and is so treated, the patient allowed to suffer for months, to run down in general health, and finally be relieved by nature, by the spontaneous opening of the abscess through the external plate.

The object of Fulton's paper is to draw attention to a disease which is most frequently overlooked, since it is one of the most difficult to diagnose. More careful study of its clinical features, and more extensive reports of cases illustrating it, may render its diagnosis more easy in future. It produces great pain, agony, and most alarming symptoms.

Frothingham⁴⁶²_{p.229} follows on the indications for the artificial perforation of the mastoid process and the best method of performing the operation, quoting Hotz,⁶⁶_{v.9,p.159} Buck,⁶⁶_{v.3,p.216} C. H. Burnett,¹¹³⁵₁₈₈₃ Strawbridge, Theobald, Roosa, and Knapp. Richey⁴⁶²_{p.841} says, "The Scylla of a needless operation and the Charybdis of not performing it, or of doing it too late, must be both avoided, and much must be left to the judgment of each individual surgeon."

Mastoid and Brain.—E. Friedenberg¹⁵⁰_{Mar.} gives a compact *résumé* of the anatomical facts involved in a proper understanding of the cerebral complications of middle-ear disease, as a prologue to an exhaustive discussion of the operative opening of the mastoid process. "The middle ear consists of a series of connecting cavities which by means of the Eustachian tube communicates with the pharynx and are lined with a membrane, which is a direct continuation of the pharyngeal mucosum. Of these osseous cavities there is in the anterior region the tympanum, an irregular, triangular pyramid, narrowed from without inward, separated from the external canal by a fibrous membrane, and traversed by a chain of ossicles with their muscular and articular attachments. In the posterior region is to be distinguished a horizontal portion, the mastoid antrum, the large, long, and irregular cavity, and a vertical portion, the mastoid cells. The latter are in about 37 per

cent. pneumatic; in 43 per cent., partly pneumatic and partly diploëtic; and in 20 per cent. altogether diploëtic. The continuous membrane lining all of these cavities is distinguished by its thinness, and is in intimate relation with the bone which it serves as periosteum. If now the middle ear suffers inflammation, all parts of it must become involved, if not all to the same degree. In the case of suppuration in these bony cavities, we have to do with empyema or abscess of the bone; and if by introduction of the bacteria of decay there takes place decomposition of the products of inflammation, there is added caries, necrosis, and the formation of cholesteomous masses. In addition to the perils accompanying like processes elsewhere in the body, there are here especial dangers from the proximity of vital structures. The roof of the tympanum forms at the same time a portion of the floor of the middle cranial fossa, and a purulent inflammation is readily propagated by way of the vessels and their connective-tissue structures, or directly by carious and necrotic solutions of continuity in the bone to the dura mater and brain, causing meningitis and cerebral abscess. From the floor of the tympanum a like process might involve the internal jugular vein, producing phlebitis and thrombosis, or an erosion of its coats with fatal hæmorrhage. From the anterior wall there is danger to the internal carotid, with the formation of thrombi or erosion, causing a hæmorrhage generally fatal. From the inner wall the pus finds its way into the labyrinth and thence into the cranium. From the mastoid cells the inflammation may extend through the petromastoid canal into the cranial cavity, or involve further the transverse sinus and cause inflammation of its wall with thrombosis, or erosion of hæmorrhage. The fatal termination of a purulent otitis media may therefore be due to: 1. Pyæmia, exhaustion, or tuberculosis, as in bone abscesses elsewhere. 2. Purulent meningitis and cerebral abscesses. 3. Phlebitis, embolism, thrombosis, and septicæmia. 4. Phlebitis of the cerebral sinuses. 5. Hæmorrhage from the ear."

Concerning the mortality of the middle-ear suppurations the statistics are wanting, but the rate is higher than has been generally assumed. Of the eighty cases of cerebral abscess collected by Lebert 25 per cent. had origin in the middle ear. In the cases of thrombosis of the jugular and cerebral sinus analyzed by Wreden there was purulent otitis media in 14 per cent., while in

those of von Dusch 62 per cent. was reached. These figures warrant the demand for a rational therapy based upon the general principles of bone surgery. The essentials are removal of secretion and a thorough asepsis. Evacuation of the tympanum is effected by a stream of water or the air-douche per tubam, after a perforation in the membrana has been produced, either spontaneously or by instrumental agency. But such does not relieve the antrum, whose communication with the tympanum is small and often closed by inflammatory swelling or by cicatricial formations. There is no way of thoroughly disinfecting this cavity other than to open the mastoid process.

As to the method of operation, together with after-treatment, Fridenberg favors decidedly that of Schwartze, who rejects all boring instruments as being rendered dangerous by the smallness of the field and the close proximity of the brain, and substitutes therefor hammer and chisel. The procedure is as follows:—

After due shaving and disinfection of the field an incision is made in the scalp, beginning one centimetre above the linea temporalis and extending in a light curve parallel to and about one centimetre removed from the insertion of the concha along the whole length of the process to its very end. Fistulous openings are to be included in this incision, or to be connected with it by cross-cuts. The periosteum is then to be incised and separated from the bone as far forward as the spina supra meatum, or the posterior margin of the bony meatus canal. The spina can often be recognized by the little finger inserted in the meatus. If, after controlling of hæmorrhage and proper retraction, a carious point appears, it should be chosen for attack, an opening being made with gouge and spoon. Small fistulous openings are to be sufficiently enlarged by hammer and chisel until proper drainage is secured. If there are sequestra the openings should be large enough to permit their removal. If there be a simple caries it will suffice to scrape out all diseased bone, pus, and granulation tissue. In completing the operation by a thorough irrigation care should be taken that the fluid does not pass by way of the Eustachian tube into the larynx and œsophagus. If, on the other hand, the bone presents a normal appearance, a point for opening must be selected which will most readily reach the antrum without involving the sinus or cranial fossa, and the best is, in fact, that where most often

spontaneous opening occurs, viz.: in the superior and anterior quadrant of the process, upon a level with the meatus (spina supra meatum) and five to ten millimetres behind the same, where the bone displays a great number of nutrient foramina. The extreme limits of safety are superiorly the linea temporalis, through which (according to Hartman and Bezold) a horizontal plane is tangent to the floor of the cranial fossa, and, anteriorly, a perpendicular line two to three millimetres to the rear of the spina. Within these limits a crater-like opening, oval from above downward, is made with hammer and chisel. The blows should be short and the chisel always held obliquely. As soon as the outward contour of the opening has been marked further progress should be in funnel-shape, and in a direction parallel to the posterior wall of the canal. In the beginning a broad chisel may be chosen, but as the operation proceeds it must be exchanged for a smaller one. In the vicinity of the linea temporalis it is never safe to hold the instrument horizontally, but always obliquely inward, downward, and forward, to avoid injury to the dura mater. The opening in the corticalis should be as large as possible, but should not exceed twelve millimetres in diameter. In an adult the antrum is generally reached at a depth of twelve to eighteen millimetres. In case of thickening or osteosclerosis of the corticalis one may penetrate with the greatest caution to a depth of twenty millimetres, or at most twenty-five millimetres, *i.e.*, to the depth of the tympanum. Beyond this there is danger to the facialis and labyrinth.

With the most deliberate scaling off of the bone, it nevertheless happens, now and then, that the dura mater or the membranous wall of the sinus is exposed. Such, however, is not a dangerous complication, as the parts laid bare are promptly protected by granulation tissue and cicatrization. One fatal case of complication from dural injury with consecutive meningitis has been observed by Schwartz, but even an opening of the sinus is less dangerous than has been supposed. This accident, which makes itself known by a sudden and profuse venous hæmorrhage, demands an interruption of the operation and an antiseptic tamponade. Schwartz, Groenlund, Jacobi, and Knapp report each an observation, all four cases recovering. In the fatal case communicated by J. S. Miller, death was due to pre-existing meningitis

and cerebral abscess and not to injury of the sinus. When, in consequence of osteosclerosis or anomalous position of the sulcus transversus, the antrum cannot be opened by the typical method, it is proposed by D. K. Wolff that an entrance be effected by chiseling into the posterior wall of the external auditory canal—the concha to this end having been detached and the periosteum having been dissected loose. The depth and narrowness of the field of operations renders this method extremely difficult, and the possibilities of the after-treatment are, furthermore, limited. The typical operation is completed by antiseptic irrigation, the insertion of a drainage-tube, and suture of the wound, after which a closed dressing is applied. If the dura mater has been exposed it should be dusted with iodoform. The after-treatment is essential and cannot be committed to an inexperienced person. The patient is to remain at least a week in bed, to avoid all movement and exertion, to be allowed low diet only, and to be secured free movement of the bowels. After two to three days the first dressing may be removed and the cavity irrigated with a 3 to 4 per cent. saline solution to which is added any available antiseptic. This should thereafter be repeated daily, with a gradual increase in the pressure until the fluid appears in the external auditory meatus. Such may not occur for several days, and in a case of Schwartz it did not appear until after three weeks. In no instance should the pressure be great enough to cause headache, vertigo, or syncope. The drainage tube may be gradually reduced in size and finally give place to a stylus of lead which in its turn may be in like manner reduced and finally withdrawn altogether. When a very large opening has been made, the canal may acquire a pseudo-membranous lining and remain patent as a fistula. During the later treatment a mechanism analogous to a hernial truss is of utility in holding the dressing in place.

As to the prognosis of the operation, the combined statistics of one hundred cases of Schwartz, one hundred cases of Lucae and Jacobson, and one hundred cases in the Halle clinic (between the years 1863 and 1866), give a showing of one hundred and eighty-six cases of recovery, or 60 per cent. The fatalities were forty-six cases, or 15 per cent., and the cases remaining under treatment (result unrecorded) about 25 per cent. Of the cases of Schwartz, only six are designated as uncured; in the one hundred

cases of Lucae and Jacobson there were thirty-one. In the forty-six fatal cases there are only two, or less than 1 per cent., directly attributable to the operation itself, and one was due to a traumatic meningitis of the convexity of the brain from injury to the dura mater. In the second case there was a septic meningitis caused by direct injury of the brain by the knife. In the other forty-four cases death was independent of the operation—latent cerebral abscess, pyæmia, hæmorrhage from the transverse sinus, meningitis in consequence of labyrinthine necrosis, and like pathological conditions. When we take this mortality of 7 per cent. into consideration, we should also recognize the *indicatio vitalis* which presents itself.

CEREBRAL ABSCESS AND MIDDLE-EAR INFLAMMATION.

Barr,²_{v.2,p.45} reports two instructive, and in many respects remarkable, cases of cerebral abscess in consequence of middle-ear inflammation, in which operative procedure was successful. The first was briefly as follows: A boy, nine years of age, of excellent family and personal history, but with an otorrhœa (A.D.) of eight years' standing, was admitted to the Glasgow Eye and Ear Infirmary with a recent history of intense pain in the affected ear, cephalalgia, vomiting, stupors, rigors, and slowing of the pulse. There was a very short, dry cough and the face was livid. Analysis of the urine by Dr. Somerville showed (1) fever, by its diminished quantity and high specific gravity, by its high color, acid action, and free elimination of urate extractives (urophœcin, urærythrin, and indican); (2) that the process was still going on by the disappearance of the chlorides; (3) that there was rapid waste of nervous tissues by high percentage of phosphates. Three days after admission to the ear hospital Dr. Barr perforated the mastoid process, and washed out the middle ear with a disinfecting solution. This operation was followed by no distinct subsidence of the symptoms, and Dr. Macewen then trephined the skull. A half-inch disk of bone was removed from the squamous portion of the temporal bone at a point an inch and a half above and half an inch behind the centre of the external auditory meatus. A hollow needle was inserted into the brain, and, after it had penetrated the brain-tissue for about three-quarters of an inch, there was a sudden escape of foul gas followed by two drachms of offensive,

yellowish-colored pus, while shreds of sloughed brain-tissue were removed by the forceps. To insure perfect drainage, a second aperture was drilled just above the external auditory meatus. Chicken-bone drainage tubes were inserted. The parts were dusted over with boracic acid and covered with sublimated wood-wool pads. The wound was only dressed once a week, and at the end of six weeks it was quite healed. The ear discharge was also completely at an end, while the hearing distance was $\frac{5\frac{1}{2}}{40}$. Bone-conduction was good and there was an excess of air-conduction. A soft depression marked the position from which the disk had been removed.

The second case was that of a young man, aged twenty-one, who was operated upon on the 15th of May last. There had been a discharge from the left ear for eight or nine years. For three weeks before the operation the symptoms were headache, vomiting, slow and intermittent pulse, normal or subnormal temperature, contraction of left pupil, paresis of all the ocular muscles with exception of the external rectus, partial facial paralysis on the opposite side, paresis of right arm, with wrist-drop. The mastoid was first trephined, so as to establish communication with the external auditory canal, but little or no pus was found there. Dr. Macewen then trephined above the external auditory canal, and pierced the brain-tissue with a trocar. Three ounces of horribly fetid pus was removed. The cavity was syringed with a weak solution of carbolic acid. A chicken-bone drainage tube was inserted. The dressing was not removed for three weeks, when the wound was found to be almost healed. The patient recovered without a single bad symptom. The opening was filled up with firm bone and the patient was now perfectly well.

E. Schmiegelow, of Copenhagen, ³²⁸ ⁵ reports several cases of the above-named nature:—
* Feb.; July

The first case was one of primary disease of the base of the skull and the brain, either hæmorrhagic or neoplastic in nature. This was followed by secondary necrosis of the petrous portion of the temporal bone and purulent softening of the temporal lobe of the brain. Subsequently a chronic purulent otitis media became established. Acute leptomeningitis followed. The history of the patient showed that in his work he had often received blows and knocks on his head. He had suffered for years with a chronic

non-purulent otitis media. Suddenly, intense neuralgia of the trigeminus of the right side in all three of its branches set in. This was soon followed by facial paralysis of the same side, choked disk and optic neuritis, all showing that a lesion had occurred at the base of the brain, near the apex of the pyramid of the petrous bone. The exudation in the right ear must be regarded as the expression of a reflex neurosis from the trigeminus. The second case was one of acute otitis media suppurativa, followed by pyæmia and caries of the mastoid process and endocranial abscess. The mastoid process was opened by a chisel, and recovery took place in three weeks, so as to permit the patient to attend dispensary treatment; in one year entire recovery, with hearing for watch at nine inches, and for the voice across a room. The third case was one of acute suppurative otitis with paralysis of the facial nerve and marked cerebral depression. There were symptoms of mastoid retention of pus. This cavity was opened, and the transverse sinus accidentally penetrated. The patient, however, seemed to be getting well when, on the seventh day of apparent convalescence, she fell back in bed, and, after becoming cyanotic in the face, died in a few seconds. There was no post-mortem examination.

CARIES OF THE TEMPORAL BONE WITH HERNIA OF THE CEREBELLUM.

Kulm³²⁶_{BA, 26, H. 1} reports an interesting case. The patient was a girl of eight years, who, in consequence of a long-standing caries of the tympani, had lost a portion of the mastoid and temporal and occipital bones. The tumor, of the size of an apple, appeared in the osseous opening. It was soft and presented faint pulsations, but provoked by pressure no nervous phenomena. The tumor was removed without any cerebral manifestation and the after-treatment progressed favorably to the eighteenth day, when suddenly there was fever, prostration, meningeal symptoms, and exitus lethalis. The autopsy revealed a perforation of the superior wall of the tympani, which was the point of departure for the purulent meningitis.

John F. Fulton, St. Paul,²³¹_{Dec. '97} reports a case of primary inflammation of the mastoid process. The disease is often confounded with neuralgia, as diagnosis is difficult and sometimes impossible. The cardinal symptom is pain, other auditory disturbances being absent. The only pathognomonic symptom is a swelling behind the ear.

ABCESS IN THE LEFT TEMPORAL LOBE WITHOUT DISTURBANCE IN
HEARING AND SPEECH.

H. Senator, of Berlin,³⁰⁹_{v.12} observed in a post-mortem examination of a man who had died of suppurative hepatitis and consecutive peritonitis a small abscess the size of a walnut, filled with thick, yellow, odorless pus, in the left temporal lobe. It was placed so deep that the cortical substance was untouched by it. The abscess possessed several irregular offshoots which extended above and below in the temporal convolutions, and nearly reached the cortical substance, but the parts thus touched appeared only slightly reddened. A second, small abscess, the size of a pea, was found in the semi-oval centre of Vieussens; otherwise the brain was free from disease. The abscess in the temporal lobe was in that part of the brain the destruction of which is usually followed by sensory aphasia (Wernicke) or word-deafness (Kussmaul), but in this case it had not betrayed its existence by such symptoms. During his illness the patient had complained only of intense tinnitus in the left ear, but examination of the ear revealed nothing abnormal.

SIMULATION OF DEAF-MUTISM.

A. Popoff, of Kazan,⁷⁵⁴_{No.24} details a highly instructive and probably unique case of artistically simulated deaf-mutism. The artist in question, a young soldier, five months in service, was sent (in March, 1885) to the Orenburg Military Lazaretto for examination in regard to a complete loss of speech and hearing, of an apparently sudden origin. Repeated examinations by several surgeons in all possible ways (palpation, auscultation, percussion, laryngoscopic, and auroscopic examinations, etc.) utterly failed to detect anything abnormal about any of his organs. On the other hand, an assiduous experimentation with a tuning-fork invariably gave negative results as regards his hearing. The man remained mute as a fish during the whole of his six months' stay at the hospital, under all possible circumstances. His silence was impregnable. Suddenly calling him by name during a visit, threats, attempts at frightening him, suddenly arousing him from sleep at night in a dark room, thrice repeated chloroform narcotization, a full intoxication on vodka (brandy), titillation of the nasal and faucial mucous membranes, irritation of the skin by the faradic current, pricking with needles—in short, all of those inquisitorial procedures

in vogue for the detection of simulation, and which would be comical were they not so degrading to the medical man compelled to play the detective's part—all alike failed to elicit a single word or even a distinct articulate sound from the examined (or rather tortured) man. The most careful, watchful, and constant secret surveillance failed to bring to light one single point that would suggest simulation. In view of all these facts the hospital surgeons unanimously came to the conclusion that the patient "was suffering from complete aphasia." The man was discharged to join his regiment and to be secretly watched for three months by a regimental doctor. The latter could only support his colleagues' diagnosis, and accordingly the soldier was dismissed for good. He proved stupid enough to return to his native village. About half a year later some volunteer detectives amongst his co-villagers informed the local authorities that the man, while continuing to play the part of a deaf-mute with strangers, was conversing quite freely with his next of kin. An inquiry was duly instituted which led to a full exposure. In August, 1887, the unlucky fellow was re-examined by a military doctor, recognized now as "quite healthy and fit," and compelled to again enter the military service.

Justyn Farlinsky⁶¹_{May 26} reports three rare and curious cases of voluntary mutilation, observed by him in the Roumanian army. In the first case examination showed traces of traumatic lesions in the internal auditory meatus, but the functional symptoms were not justified by any lesion of the membrana tympani nor of the remainder of the ear. Simulation was suspected, lesions of greater or less extent were found at each examination, and finally the head of a phosphorous match was found in the secretions. There was no perforation of the drum-head in this case. In the second case there was perforation with subacute internal otitis, caused by the introduction of a piece of unslacked lime, which was then moistened. Fragments of the lime were found in the auditory canal. In the third case Karlinsky found a large perforation with everted edges, which had been produced by a curved piece of iron wire. The patient had been in the habit of using this wire as an ear-pick, and it was somewhat uncertain whether the perforation was intentional or not.

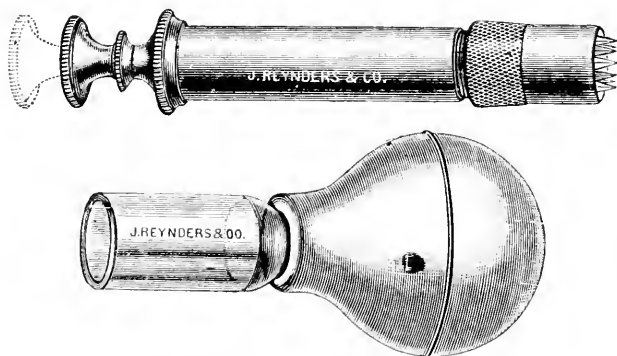
NEW INSTRUMENTS.

Graham Bacon¹_{Jan.} prefers wet-cups to the leech, and has had

constructed a modification of Horteloup's artificial leech. (See Figs. 2 and 3.)

There is a scarificator in which six lance-shaped needles are concealed. The depth of the punctures can be regulated by screwing and unscrewing the cap of the scarificator. The cupping glass is made small and adaptable to the parts around the ear, and may be applied close to the tragus or below the lobule or over the mastoid process. The glass itself holds three drachms (12 grammes). If necessary, three cups can be applied at once to the sites named.

The techniphone snap, a substitute for the watch as a test of hearing, is the name suggested by H. Byrd Young¹⁶²_{p. 873} for an instrument simple of construction, easily managed, and reasonably uniform. Taking it all in all, it is a more convenient test than a watch.



FIGS. 2 AND 3.—BACON WET-CUP.
(*New York Medical Journal*.)

Bishop⁶¹_{v. 11, p. 408} has devised a modification of Siegle's pneumatic otoscope. The advantages claimed by the inventor over the speculum are: (1) it is self-illuminating, not requiring the aid of a hand-mirror, or forehead-mirror, the light being accurately focused on the drum; (2) it affords a magnified view of the drum; (3) the object-mirror presents a perfect picture of the interior of the ear, and without the necessity of looking through a lens; (4) it can be operated in a smaller canal than will admit the speculum; (5) the bright reflection of light into your eyes by the glass of the speculum, the black background of which converts the glass into a mirror, can be avoided in the otoscope by the proper and unvarying relations, and the color of its various parts. (Fig. 4, next page.)

Wm. Robertson, of Glasgow,⁶_{Oct 29} has invented a syringe for

the middle ear, which he describes as follows: The straight part of the tube is three inches long, so that it can be used with ease

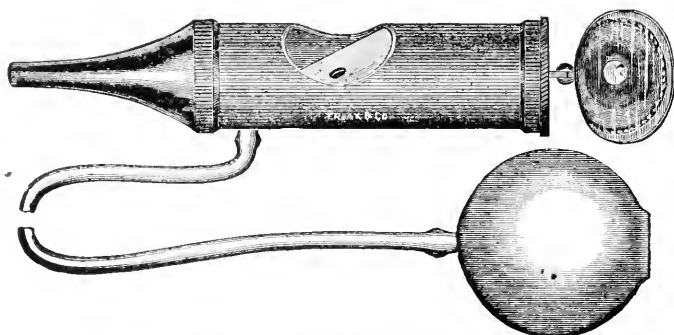


FIG. 4.—BISHOP'S MODIFICATION OF SIEGLE PNEUMATIC OTOSCOPE.
(*Journal American Medical Association.*)

through a speculum; it is provided at the distal end with a movable beak, but at an open angle, and united by a slip-joint. The beak can thus be revolved in any direction. The proximal end of the straight tube is bent at an open angle, and continued for an inch; and to this is fixed by a slip-joint a one-ounce balloon. The calibre of the tube throughout is one millimetre, and the syringe, when put together, feels light and solid, so that in its use no jarring need be communicated to the parts when it is placed *in situ*. Again, the fineness of the tube, and the direction given it at the proximal end, render it possible to keep it well in view during operation. With this instrument it is perfectly possible to thoroughly cleanse every part of the tympanic cavity, no matter how small the perforation and where situated. (Fig. 5.)

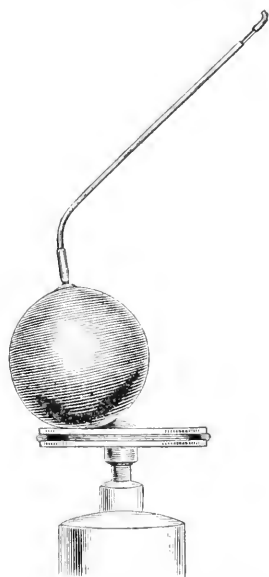


FIG. 5.—ROBERTSON'S SYRINGE FOR THE MIDDLE EAR.
(*London Lancet.*)

The accompanying cut represents a "Manometric Aspirator for the Tympanum," devised by Dr. Garrigou-Désarènes.¹⁰⁸ June 1 It is composed of (A) an oval glass to be applied over ear; B, a manometer indicating

degrees of negative pressure vacuum; C, a fitting connecting manometer, with apparatus; D, an opening for re-entrance of air,

which opening is closed with the finger during exhaust. (See Fig. 6.)

Garrigou-Désarènes²¹_{Mar. 25} commends, for artificial membrana

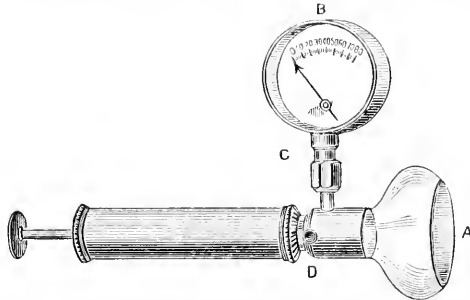


FIG. 6.—GARRIGOU-DESARENES' MANOMETRIC ASPIRATOR.
(*Revue de Thérapeutique.*)

tympani, gold-beaters' skin, "baudruche," prepared from the intestines of the sheep or ox. A small disk is dropped into the

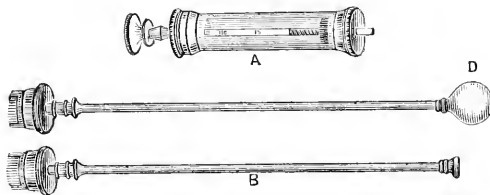


FIG. 7.—PRAVAZ SYRINGE, MODIFIED FOR USE IN APPLYING
ARTIFICIAL MEMBRANE.
(*Journal de Médecine de Paris.*)

auditory canal; the disk is softened by the instillation of a few drops of water. It is then forced against the perforation in the

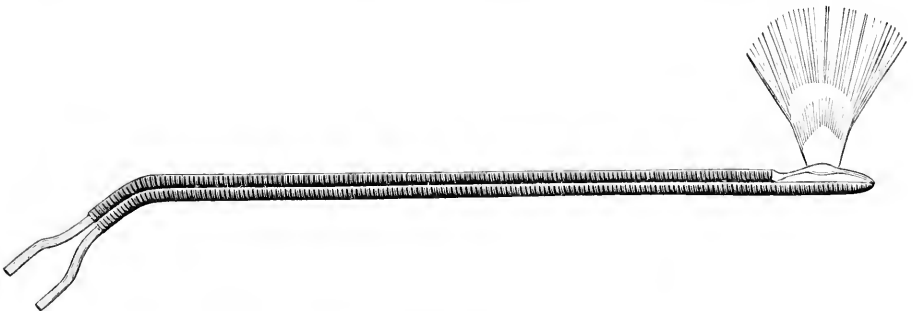


FIG. 8.—LOEWENBURG'S GALVANOCAUTERY ELECTRODE.
(*L'Union Médicale.*)

membrana tympani by a special apparatus, which consists of a small Pravaz syringe, A; B, a nozzle with a flanged extremity,

over which is stretched a disk of sheet-rubber, which, upon being distended with water from the syringe, becomes a ball as seen at d, and by this means the disk, artificial membrane, can be forced (*i.e.*, placed) against the perforation without danger or injury to the parts. (See Fig. 7, page 55.)

Loewenburg's¹⁷_{AUG. 4} universal nasopharyngeal galvanocautery is recommended by the inventor in the treatment of furunculosis, etc., of the external auditory canal. The essential principle of its construction is that of lateral action. (See Fig. 8, page 55.)

DISEASES OF THE NOSE AND ACCESSORY CAVITIES.

By CHAS. E. SAJOUS, M.D.,

PHILADELPHIA.

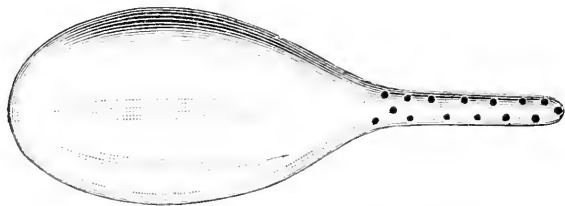
DISEASES OF THE ANTERIOR NASAL CAVITIES.

Acute Rhinitis.—Massei, of Naples, corresponding editor, refers to the paper of Cardone,⁴⁶¹ on the parasitic nature of acute rhinitis, in which he insisted upon the similarity existing between that disease and pneumonia, not only as regards contagiousness, but also as to all clinical features. He found the secretions to contain the streptococcus pyogenes, the staphylococcus aureus et albus, and in larger quantities the diplococcus of Fränkel and the pneumococcus of Friedländer. He concurred in almost every particular with the views formerly expressed by Thost. In a paper bearing principally upon the chronic forms of catarrh, Hajek, of Vienna,⁴ comes to very much the same conclusions as regards acute coryza, laying special stress upon the frequent presence of Friedländer's bacillus. He is not of the opinion, however, that the affection is primarily of bacterial origin, but believes that the bacteria cause secondary vegetations in the pathological secretion, and ultimately its fœtor and color.

Coryza in children, especially as regards the resemblance of some of its symptoms to other diseases, has received the attention of Paul Le Gendre⁶³ and Coriveaud.²¹² The former reported a case in which the dyspnœa resulting from the nasal occlusion was so great that cyanosis and other indications of impending suffocation suggested the presence of croup as soon as the infant was given the breast or was placed on its back. Tightening of the lips around the nipple closed the only avenues for air, while descent of the tongue and apposition of its base to the posterior wall of the pharynx during oral respiration produced the same effect when the child was in the recumbent position. Coriveaud's case was that of an infant one month old, in whom severe chorea accompanied an acute coryza, which disappeared as soon as the latter had been relieved.

Schroetter,³¹²_{No. 8} of Vienna, reports a case of acute coryza in which a tumor filling the right nasal cavity presented itself a few days after the onset of the trouble. The mass ulcerated and gradually disappeared, microscopical examination demonstrating it to be merely of an inflammatory nature.

In the treatment of infantile coryza, Le Gendre, in the case above mentioned, passed a small sound into the nasal cavity and employed irrigations of borate of sodium solution to thoroughly wash out the secretions, which were the principal cause of trouble. This measure can hardly be recommended, not only on account of the danger of suffocation through passage of the liquid to the larynx, but on account of the danger of forcing some of it into the Eustachian orifices and tubes and thus producing otitis media. I have found in blotting-paper quite as effective and less dangerous an assistant, a small piece of it being rolled between the fingers and then introduced into the nostrils. Much of the



SOFT-RUBBER PUMP FOR INFANTILE CORYZA.

secretion is absorbed by the paper, while contact with the erected turbinated bodies causes them to collapse, thus rendering effective the sneezing that follows. Liquid cosmoline into which cocaine has been dissolved in the proportion of 2 per cent., applied in the same way and over the bridge of the nose every three or four hours, then suffices to keep the passages free and the infant comfortable. I have also used the soft-rubber pump shown in the cut (exact size), not only to empty the nostrils of their contents, but to apply the cosmoline and cocaine, using the tip for this purpose as if it were a camel's hair pencil. It is obvious that the instrument should always be thoroughly cleansed and disinfected after using.

William Cheatham, of Chicago, collaborator, recommends for these cases and for children who suffer much from coryza, a spray of borate of soda, half a drachm (two grammes), and infusion of coca, eight ounces (two hundred and forty-nine grammes). The

fluid can either be used with the atomizer or thrown into the nostrils with a dropper. He believes this solution to be capable of reducing the tendency to relapses and deems it safer than cocaine.

Trechinski⁵⁰⁹: ⁶⁰_{Oct.13} recommends powdered quillaya bark. This is placed in a paper bag and the patient is directed to shake it up vigorously and to snuff the dust thus formed every few minutes. The secretions are first increased, then diminished.

Simple Chronic Rhinitis.—Although the year has brought out a large number of articles (over sixty), but little that may be termed new has been suggested.

H. H. Rusby, of New York, ⁸⁰_{Aug.15} proposes coccillaña bark (*Egyccarpus Rusbyi*) as a new remedy for chronic rhinitis and other disorders of the nasal tract, upon purely theoretical grounds, however. Having administered it internally to three individuals, he found the effects to greatly resemble those of ipecac, being probably due to a strongly active principle related to emetine, which is excreted through the mucous tract. Inhalation of the dust of the bark produced profuse discharge and sneezing, effects observed when administered internally. The vessels and glands of the mucous surfaces were stimulated to overaction, subsequently leaving them in a state of sedation. Trechinski⁵⁰⁹_{No.8} recommends quillaya bark, employed in the manner described above.

Hypertrophic Rhinitis.—Dr. Gouguenheim, our Paris corresponding editor, reports an histological study by Chatellier¹⁴_{p.104} of the structure of hypertrophic tissue. He found the cellular elements to consist of corpuscles containing a nucleus, and sometimes several. Between these cells he found fibrillæ, the true nature of which could not be ascertained. They differed from cellular tissue in that they could not be colored with pierocarmine, but with hæmatoxylin, and swelled only by the action of acids. It is not coagulated fibrine; Weigert's coloring rendering this ascertainable.

Guye, of Amsterdam, ⁶⁰_{v.13, No.43} gives the history of four marked cases of *aproxexia*, a name which he gave last year to a condition of inability to fix the attention upon a special subject, such as reading, conversing, etc., occurring in persons suffering from a catarrhal disorder of the nose. Three of these cases were students; one was obliged to go over three or four times what he read in order to understand it; another would forget in two weeks everything he had learnt in preparing for examination; another when

entering a room from the street, and therefore a colder atmosphere, could not for a considerable time understand the simplest thing told him. Memory depending principally upon the amount of attention that one is able to give a subject, inability to give attention naturally involves loss of memory. Guye recognizes three kinds of aprosexia: first, physiological aprosexia, the result of brain strain or overwork; second, neurasthenic aprosexia, in which nervous debility plays the important part, and, third, nasal aprosexia. Various combinations of these may occur. The benefit obtained in those cases in which the main pathological conditions were hypertrophies of the inferior turbinated bodies and adenoid vegetations was so marked that there can be no doubt that aprosexia should be universally recognized as one of the frequent complications of nasal disorders,—a fact which I have already been able to ascertain.

The relation between chronic nasal obstruction and hernia is mentioned by Freudenthal, of New York,³¹²_{Nov.} whose attention was called to the matter by the instance of a family of seventy-seven persons, 22 per cent. of whom suffered from hernia, while hardly a member was free from some affection of the upper air-passages. In the New York Hospital for Ruptured and Crippled he found one hundred and forty-three out of five hundred cases of hernia suffering from marked nasal obstruction. He therefore concludes that the constant hawking, blowing, spitting, etc., increase the abdominal pressure and form thereby a frequent etiological factor in the production of asthma.

As an evidence of the size that hypertrophies may attain, G. D. Woolen, of Indianapolis,²²⁷_{Oct.} reports a case in which the mass attached to the posterior extremity of the right inferior turbinated body extended to half an inch below the margin of the soft palate on the right side, causing it and the pillars of the fauces of the same side to bulge forward and fill the posterior region of the mouth and much of the faucial region. The mass presented the familiar rough and wavy surface, and could not be mistaken for any other growth, although a polypus was found to occupy the anterior portion of the same side.

Fritsche,¹¹⁶_{June;} ⁹_{Aug. 18} of Berlin, tried sozoiodol in eighty-eight cases of rhino-laryngeal disease. The remedy was used in combination with potassium, sodium, zinc, and mercury. The combination with

the first two was used of normal strength ; that with zinc, of one-fifth to one-tenth ; and that with mercury, of one-tenth to one-twentieth. The best results were had in all catarrhal conditions with a tendency to inspissation of the secretion. In hypertrophic rhinitis and rhino-pharyngitis with chronic thickening, the alternate insufflation of the three crystalline combinations proved most successful. With increased secretion the swelling of the mucous membrane grew less and the erectile tissue contracted, so that respiration became correspondingly freer. The crystalline salts caused a rapid healing of wounds after the use of galvano-cautery.

F. Whitehill Hinkel, of Buffalo, ¹_{Oct. 20} found that antipyrine possessed a somewhat similar retractive effect on the turbinated tissue to that of cocaine. Sixteen grains (1.07 grammes) to the ounce (30 grammes) of water with a few drops of glycerine was as strong as could be readily borne, and served the purpose. It presented an advantage over cocaine in avoiding numbness and dryness of the parts and overstimulation of the nervous supply, but failed to procure the relief of severe inflammation or extreme occlusion of the nares. No anæsthesia could be produced, but a sedative action that might also be of use in spasmodic sneezing, coryza, hay fever, etc., was observed. The application caused smarting.

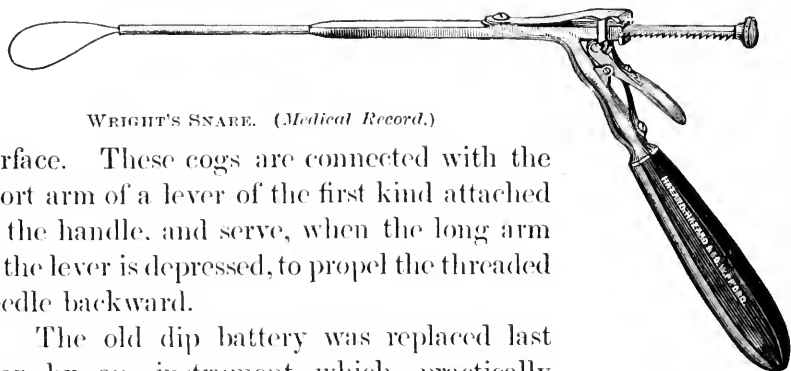
In the course of an operation for the removal, by means of serrated scissors, of a large hypertrophy, a patient under the care of Daly, ⁵⁹_{Sept. 22} of Pittsburgh, became greatly frightened and left the office suddenly after the first cut had been made. A year later the mass was again examined, when it was found that after freely bleeding at first it had gradually returned to normal dimensions. Daly now treats similar cases by making small punctures from time to time, so as to allow bleeding to the extent of one to three ounces. The results have been excellent, especially when the growths were erectile.

Massei, corresponding editor in Italy, writes that Faravelli and Kruch ³⁰_{No. 3} have studied the relations between chronic diseases of the lachrymal apparatus and those of the nose. In thirty out of thirty-five cases they have found in chronic alteration of the lachrymal apparatus, an impairment of the nasal mucous membrane or a deflection of the nasal septum. They are of the opinion (1) that diseases of the lachrymal apparatus depend, in the greater number of cases, upon disease of the nose ; (2) that the

forms most frequently met with are (a) diffused or circumscribed hypertrophy; (b) simple atrophy; (c) abnormal deviation of the septum and contact with the lower turbinated bone; (d) catarrhal rhinitis and (very seldom) ozena.

T. W. Gleitsmann, of New York, ⁵⁹_{Mar. 17}, in order to obtain the elasticity and resiliency of piano wire in cautery loops, devised a composition of platinum and iridium, which heats as well as pure platinum and does not become bent at each obstacle. It offers the same resiliency as steel wire, and retains the loop shape necessary to properly engage posterior hypertrophies, polypi, etc.

J. Wright, of New York, ⁵⁹_{Mar. 17}, modified in an ingenious manner my nasal snare to adapt it to rapid work, and, by adjusting a handle to it, renders the use of only one hand necessary. The threaded bar is replaced by a straight bar, furnished with cogs at its under

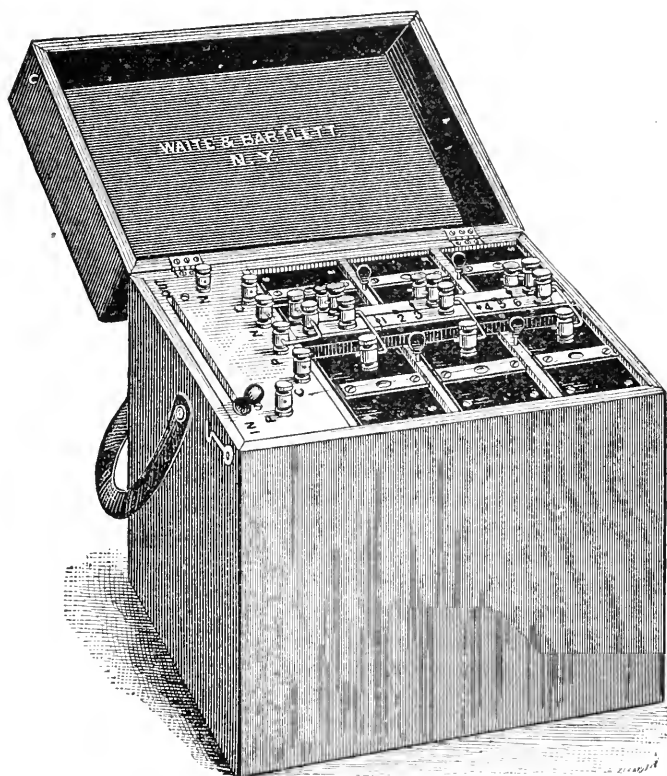


WRIGHT'S SNARE. (*Medical Record*.)

surface. These cogs are connected with the short arm of a lever of the first kind attached to the handle, and serve, when the long arm of the lever is depressed, to propel the threaded needle backward.

The old dip battery was replaced last year by an instrument which practically does away with the numerous disadvantages which have caused many practitioners to banish galvano-cautery batteries from their *armamentarium*. The new battery consists of a case divided into four compartments. In three of these are placed storage cells, the fourth being reserved for a rheostat, by means of which the current may be regulated to a nicety, thus enabling the operator to use small knives, with no risk of overheating and melting them. Across the tops of the cells, and firmly affixed to the partitions in the case, is a switch by means of which the cells may be arranged in series for the purpose of using knives and points constructed of fine wire, and quickly changed to parallel circuit, so that a large, broad knife may be used with equal facility. Each cell contains two positive plates of the capacity of six ampère hours

each, making the capacity of each cell twelve ampère hours. This battery gives sufficient current to enable any operation in which it is desirable to use the galvano-cautery to be performed. The charging is accomplished by means of a dozen simple sulphate of copper batteries. The substantial finish and complete control of the current and ease of manipulation of the switch and rheostat make this the desideratum of cautery batteries.



WAITE & BARTLETT STORAGE GALVANO-CAUTERY BATTERY.

Richardson,^{38 61} of London, describes a preparation designated "tannin wool," which he recommends as being of great service in treating ozæna and other diseases attended with fetid odors. It is said to be a ready styptic, and to possess good antiseptic properties. It is prepared by adding pure cotton-wool, bit by bit, to a saturated solution of tannin in distilled water, at 140° F., until all the solution is taken up; then drying the wool slowly in an evap-

orating dish. It should be kept in a closed bottle in the rough state, and teased out when required for use.

Fritsche,^{116 9} of Berlin, tried the preparations of sozoi-dol in cases of atrophic nasal catarrh, insufflations of the potassium and zinc preparations causing more marked improvement than other measures. The secretion lost its tenacity and the fœtor diminished. Cases of inveterate ózaena succumbed to the insufflation of the mercurial combination alternating with that of zinc, the local irritation immediately causing a copious, thin secretion, which persisted in a greater or less degree. This was followed by disappearance of fœtor.

As an easy, efficient, and always convenient mode of cleansing the nasal cavities, Ferguson, of Winnipeg, Canada, collaborator, has for a number of years trained his patients to gargle in a special manner, so as to pass the fluid employed through the nose from behind forward. "The ease with which this is done is remarkable, if the patient's attention be directed toward the necessity of keeping the soft palate hanging loosely, forming a curtain between the mouth and pharynx, while the gargle is directed through the nose by a steady expiration."

Syphilitic Rhinitis.—A. G. Hobbs,⁷ of Atlanta, records an interesting series of four cases in which gummatous growths of the nasal cavities were successfully treated surgically. In the first, a purplish growth, completely filling the right nasal space, was removed by the cutting-spoon, the bleeding being very slight. No ulceration followed and no recurrence took place. In the second, a large growth of the same color was removed by means of the snare and its base scraped, to be followed by but little bleeding, no ulceration, and no recurrence. In the third, cutting-edge forceps and the curette were employed, a deep ulcer, with subsequent necrosis, following the operation at the seat of the tumor's attachment, two weeks later. After three weeks of local applications of nitrate of silver, the ulceration healed and complete recovery ensued. In the fourth case, a portion of a large gumma was "pinched off" (probably with forceps) and the rest reduced by means of daily applications of chromic acid. In two of the cases, a clear history of syphilis could be obtained, while in the others the one presented undoubted objective and subjective symptoms, and the last was microscopically verified. Energetic specific

treatment was resorted to in three, the third recovering without it.

In concluding his paper, Dr. Hobbs offers the following deductions: 1. Surgery is not only admissible in most cases of this character, but in many instances it becomes urgently necessary. 2. The fear of producing destructive, at least uncontrollable, ulcerations has not a sufficient clinical foundation. 3. Alterative anti-syphilitic treatment is too slow to be alone depended upon when the stenosis is producing so many reflex symptoms, such as asthma, coughs, sleeplessness, headache, loss of weight, dry, parched throat, etc. 4. The loss of blood from instrumental means is not dangerous nor even alarming, and while the pain is considerable, as is the case in removing most nasal growths, it can be greatly mitigated by cocaine.

While recognizing the value of these observations I can hardly agree with the writer, my experience having taught me that cases uncomplicated by necrosis very rarely require surgical treatment when properly treated internally. I have seen cases in which extensive ulceration had already taken place yield in three weeks to a vigorous iodide of potassium treatment, the ulcerations being touched daily with nitrate of silver fused to the end of a probe. Large cicatrices, inevitable when the ulcerous portions are thoroughly extirpated, are thus avoided, an important matter when the predisposition of syphilitics to atrophic rhinitis is remembered.

Nasal Tuberculosis.—Juffinger and Hajek, of Vienna, ²²_{Dec. 19} each reported a case of tuberculosis of the nasal mucous membrane. Juffinger's patient was a girl, aged twenty-one, who presented, besides several lupoid nodules on the cheek and nose, a reddish growth of the right nasal cavity, covered by scabs and found to contain Koch's bacilli.

The proposed treatment was to remove the growth and cauterize the base with chromic acid. In Hajek's case the ulceration was on the septum, but contained no bacilli. Later on another tumor was found in the pharynx in which bacilli were discovered. Cauterization with lactic acid caused disappearance of the ulceration in five weeks, but the growth soon returned, to attain this time the size of a chestnut. This was again removed, to again disappear and return.

These cases would seem to indicate that ulcerous processes in

the nose of young subjects point more frequently to tuberculosis than is generally supposed, while the results in the second case demonstrated that too much dependence should not be placed upon local treatment.

Polypi.—In exhibiting microscopical specimens of polypi before the Montreal Medico-Chirurgical Society, Johnston, of Montreal,¹³⁰_{Feb.} stated that in eight or nine cases the condition was seen in its early stages to be strictly an adenoma of the nasal mucous glands. Later on, the changes in the epithelial cells cause a disappearance, more or less complete, of the cell outlines, leaving only areolar tissue infiltrated with mucous fluid. The writer believes that this secondary change is probably the reason why these growths are commonly, but wrongly, called myxomata, which are tumors of quite a different nature, originating in connective tissue.

In an interesting work, Woakes, of London,¹¹⁵²₁₈₈₇ reiterates the views advanced in 1885 before the London Medical Society, that nasal polypi are always associated with necrosis of the turbinated processes of the ethmoid, a conclusion which is at variance with almost every writer on the subject. Woakes believes that a simple inflammation of the lining membrane of the ethmoidal turbinated bones precedes polypus, resulting in what he terms necrosing ethmoiditis. This is owing to the fact that this lining membrane not only covers the bony surfaces, but dips into the substance of the bones and lines their cells and trabeculae, thus acting as periosteum as well as mucous membrane. The necrosed spicules keep up a constant irritation of the mucous membrane, resulting in the formation of longitudinal clefts over the necrosed surfaces. Through these clefts appear the polypi, which soon by their growth mask the underlying changes.

Dr. Woakes states that the necrosis may be easily detected by pushing a fine probe between the outer aspect of the turbinated and the wall of the nose.

In comparing the methods employed for the removal of nasal polypi, McBride, of Edinburgh,³⁶_{Aug.} states that the cauterization of the base credited to the galvanic snare is not performed in the majority of cases, the actual base of the growth being almost never reached in such a way as to enable the operator to cauterize the point of junction between healthy mucous membrane and polypoid tissue. He further comes to the conclusion that the galvanic is

much more painful than the cold wire snare. He uses the galvanic snare in sessile growths, and by burning the tissue with the wire loop around the base causes a furrow which enables the operator to obtain a firm grasp. He very properly criticises the use of forceps as unscientific and unjustifiable.

Schnitzler, of Vienna,⁵⁷_{Aug.5} reports a case of polypi in which hypnotism was accidentally induced by one of his pupils, by means of the frontal mirror. Several of the growths were snared away and their seats of implantation cauterized. Upon being awakened the patient was not aware of the operation, having suffered no pain whatever. Some time later, there being occasion to again operate, she was intentionally hypnotized, again undergoing the operation without the least suffering. This case, according to Schnitzler, was in nowise hysterical.

Creswell Baber, of Brighton, England,¹³⁶_{Nov.1} recommends a spray of 25 per cent. to 50 per cent. of alcohol, a procedure also recommended by Cozzolino and Pritchard.

Fibroma.—W. E. Casselberry, of Chicago,⁶¹_{Apr.21} removed a fibroma from the left anterior nasal fossa of a woman of thirty-nine by means of the galvano-cautery écraseur, assisted at times by the knife electrode. Instead of using platinum wire he employed steel wire, owing to its resiliency, and found it to assume red heat as well as the former, although requiring to be changed at each sitting. The growth was found to originate on the horizontal plate of the ethmoid and the anterior and perpendicular surface of the sphenoid. There had been no recurrence two years after the operation.

The superiority of zinc needles over the ordinary gold-plated ones, in the reduction by electrolysis of neoplasms, is well exemplified in a case reported by A. Shipman, of Plattsburgh, Neb.,⁶⁵_{Sept.} in which an enormous fibroma, well advanced in its destructive career, rapidly yielded to the zinc needle after unavailing efforts with the other, although all other attachments used were the same. The instrument, insulated with a piece of No. 1 elastic catheter to within one-half inch of its point, was introduced that distance into the lower part of the growth. The battery used was a twenty-four-cell McIntosh, the positive pole being applied to the thigh. Although the applications lasted ten minutes and the intensity of the current was gradually increased, the zinc needles, unlike the gold-plated one, caused no discomfort whatever.

Carcinoma.—Dr. Semeleder, of Mexico, corresponding editor, reports a case of carcinoma,¹⁷⁹_{Aug.15} the probable origin of which was in the nasal cavity, extending thence to the frontal region and invading the frontal sinus. Total extirpation, including thorough exposure and curetting of the sinus, with antiseptic precautions, by Professor Lavista, was followed three days later by acute septicæmia, due, probably, to the defective hygienic conditions of the hospital in which the operation was performed. Coomes, of Louisville,¹³⁵_{Aug.} reports another case in a boy of nine years, which, apart from the youth of the patient, was remarkable for the mushroom-like rapidity of growth after repeated operations, four days sufficing to cause it to fill all surrounding regions and cause exophthalmos and asymmetry. Hæmorrhages from the nose, throat, and ears were frequent, but not profuse.

Hinde, of Chicago,⁵⁹_{Aug.11} reports a case of primary intranasal carcinoma, which was found, when the last operation was performed, to extend to the ethmoidal cells. It was soft and very friable, bleeding freely when touched.

Enchondroma.—II. Morestin, of Paris,⁷_{No.26} reports a case (girl aged fifteen) of true enchondroma of the left cavity, starting from the cribriform plate, and operated on by Verneuil. The mass extended to and involved the greater and upper portion of the antrum, greatly deforming the face, compressed the inferior orbital plate, causing exophthalmos, epiphora, traction, and elongation of the optic nerve, the distance between the retina and the optic foramen being estimated at five centimetres (two inches). Vision, although greatly diminished, returned after the operation, which proved comparatively easy. A sigmoid incision through the overlying tissues and the greatly thinned antral wall permitted thorough extirpation of the neoplasm, which proved to be a rapidly proliferating enchondroma. (Report of Dr. Gouguenheim, corresponding editor.)

Fungous Tumor of the Dura Mater.—A case of this rare, rapidly recurring growth recently presented itself in the service of Richet.¹⁷⁷_{July 9} Soft to the touch, reddish in hue, and of the consistence of fat, it bled freely, although its density was evident when pricked with a needle. It arose from the apex of the left cavity, great pain being experienced in the naso-frontal region. There was asymmetry of the face with slight exophthalmos on the same side. No operation was reported.

Angioma.—Jarvis, of New York, ¹⁰¹_{Jan.} reports an interesting case of vascular growth (negro aged forty-two) which he removed with the snare without hæmorrhage. Using the tabulated report of sixteen cases found in literature by Roe, of Rochester, and published some time ago, ¹_{Jan. 16, '86} he concludes that, properly managed, the cold wire loop is a safer, simpler, and more reliable measure than galvano-cautery, and that it offers absolutely no danger from hæmorrhage. Three hours were employed in gradually crushing the tumor.

Foreign Bodies.—Saunders, of Jamaica, ²⁵_{Nov. 20,} gives the sequel of a case of large rhinolith mentioned by Mackenzie in his work. The patient having to return home before a rhinolith, crushed with the lithotrite, could be completely removed, a small piece that had remained became sufficiently large in a few weeks to completely fill the nasal cavity.

Two other cases are reported, one by Coupard, of Paris, ²⁴ in which a button had remained five years, causing anorexia, somnolence, and bronchitis; and the other by Charazac, ¹⁶⁰_{Aug.} in which a large grain formed the nucleus of a mass of phosphate of lime sufficiently large to completely occlude the cavity. Massei, corresponding editor, mentions two cases related by Cozzolino ⁴⁶¹_{Jan.} and Masini, ⁵⁰⁵_{No. 54} in one of which the rhinolith was very large and was composed of triple phosphate and neutral carbonate of lime. Felici, of Florence, ⁶²¹_{No. 2} in a case in which stubborn, purulent discharge resisted all curative efforts, found a fragment of wood five centimetres (two inches) long imbedded under the inferior turbinated bone, and forced there by a fall from a horse fifteen months before.

Myiasis.—Todd, of St. Louis, ⁶⁵_{Mar.} reported a case of a woman from whose nose he removed, in the course of a week, sixty larvæ which exactly resembled those found in putrid meat. These hatched out in the course of ten weeks. Todd describes the fly as follows:—

“Its body is shorter than that of the common flesh fly, and of a metallic blue color, and when alive the head is enormous as compared with the size of its body; the eyes are of a very rich orange color, and the space between the eyes is of a bright silver color, giving the fly a very peculiar appearance. There would be no difficulty in recognizing such a fly, the body being short, the head very large, with the orange eyes and silver face.”

Having sent this description to an able entomologist, Dr. Williston, of New Haven, he was informed that it was the *Lucilia macellaria*, the screw-worm fly.

Powell, of Collinsville, Ill.,¹⁰⁹_{Oct.} contributes two cases to those reported, and expresses the belief that the disease is not rare, whether recognized or not, in latitudes below St. Louis. He is confident that the fly and its progeny concerned in this affection are identical with the fly and "screw-worm" said to be so destructive of cattle and other animals (that are wounded) in Texas and the adjacent countries. He knew of several cases reported verbally before the Madison County Medical Society in 1883, and describes another in which the worms were only discovered after death, hundreds of them escaping after the decease. In one of the two cases which he reports, a small boil could be seen just within the nose, which, eventually opened, revealed numerous worms. More being then discovered in other parts, he tried in vain numerous substances, some of which, although of sufficient strength to destroy the tissues, seemed to produce no effect upon the larvæ. Chloroform seemed only to stupefy them temporarily, but this was taken advantage of, using equal parts of milk as a diluent, and all the worms were finally removed, leaving the patient's nose deformed through destruction of the bridge and septum. In the second case, the same symptoms were present as in the first, erysipelas of the face, sero-sanguinolent and very offensive discharge, jactication and insomnia, formication, sensation of boring, etc. The same treatment was instituted with satisfactory results.

Weidman, of Marine, Ill.,¹⁸⁶_{Dec.} in reporting a case in his practice speaks of five others in his section, one of which resulted fatally.

Epistaxis.—In an interesting review of the subject, Joal, of Mont Dore,¹³⁶_{Feb. 1} insists particularly upon the genital factor in the production of epistaxis during adolescence, the exciting cause being either psychological, pathological, or artificial. The reflex connection between the nasal mucous membrane and the genital organs readily explains how epistaxis may be caused by engorgement of the nasal corpora cavernosa, and Joal supports his views by citing a number of cases of onanism in which the tendency to nosebleed ceased when the vice had been corrected.

Chisolm, of Baltimore,¹⁰⁴_{Dec. 24, '87} reported a case of uncontrollable epistaxis resulting from a blow on the nose received during infancy,

the blood flowing in a stream three or four hours and leaving the child pallid and dull. These attacks occurred about twice a month. If they did not occur for three or four weeks he would become lethargic and sleepy. Remedies were of no avail. Gaucher, of Paris, ³_{June 27} reports a similar case in a man, a liquor-dealer, in whom plugging had to be resorted to, all other means, including blisters over the liver, having produced no effect. The urine was found to contain a large quantity of albumen, the patient suffering from interstitial nephritis. Treatment by milk diet of the latter completely relieved the epistaxis, a fact which led Gaucher to consider the interstitial nephritis as an etiological factor of the latter. While this opinion may be correct, arterial distention concomitant with a friable and catarrhal nasal mucous membrane readily explain the *modus operandi*. The two affections may have been present simultaneously without etiological connection.

Hénocque, of Paris, ²⁸⁶_{Apr.} states that antipyrin produces a constriction of the vessels and of the tissues at the same time that it produces coagulation of the blood. It may be used in powder, in solution, incorporated into gauze, or in ointment. It may be insufflated, and then covered with wadding or other dressing. For operations it may be used in a 5 per cent. solution.

Hinkel, of Buffalo, ¹_{Oct. 20} found that antipyrin possessed, in a 4 per cent. solution, decided hæmostatic effect, though not superior to that of cocaine.

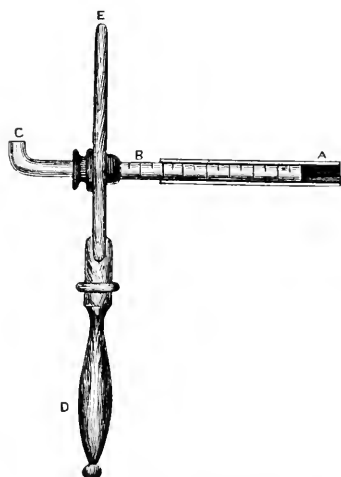
Of remedies re-suggested and extolled during the year an almost endless list could be made. Irrigation with water as hot as can be borne, Joal, ¹³⁶_{Feb.}; Alvin, ³_{June 20}; turpentine internally, Tancychill ¹⁰⁴_{Dec. 24, '87}; turpentine diluted with oil and applied with tampon, Ernyci ⁵⁶³_{No. 12}; immersion of hands in hot water, Wade ⁴⁹_{July 19}; blisters over the liver, Fisher, ⁵⁹_{Dec. 17, '87}; Guinard ²¹²_{Mar.}; injections of dilute apple-vinegar, Ghent ⁸⁵_{Feb.}; a core of thin tin, shaped as required, wrapped with cotton, used as a tampon introduced anteriorly, Kitchen ⁵⁹_{Jan. 7}; injections of lemon- or lime-juice, Geneuil ⁸²_{Mar. 10}; spray of solution of antipyrin, Chittick ²³¹_{Oct.}; cold douche over hepatic region, Petit ⁶⁷_{July 30}; oil of origanum, five drops, three times daily in emulsion, Fischer ⁵⁹_{Nov. 17}; cracked-ice tamponing and ice-compresses over the nose. ⁴⁶²

Congenital Occlusion.—Potter, ¹⁷⁰_{Sept.} of Buffalo, reports a case of unilateral occlusion, a cup-shaped depression being visible about three-eighths of an inch within the nostril. A perforation was

made through this with a trocar, which penetrated five-eighths of hard tissue before reaching the vault. The opening was enlarged with the cautery knife and the nostril plugged. Potter advocates an operation in these cases, owing to the dangers of mouth breathing and to the increasing density of the occluding wall as age advances.

Hopman, of Cologne,²²⁶_{B4.37, H.2} contributes two cases—a boy of eleven, in whom an osseous wall was found to close the right narium, and a man, aged nineteen, who also had complete occlusion of the right cavity. In both he broke the occluding wall with mallet and elevator, obtaining permanent relief.

C. H. Knight, of New York,⁹_{Nov. 10} also reported two cases. In the one, a girl of eighteen, a very dense, bony wall completely occluded the right cavity, which he perforated with the nasal trephine, enlarging the opening with the revolving burr. Although the operation proved quite successful and was not followed by narrowing of the opening, the patient is more uncomfortable than before, owing to the fact that secretions accumulate and dry in the perforated cavity. The other case, also one of bony occlusion, was seen but a few times, and no operation was undertaken.



ZWAARDEMAKER'S OLFACTOMETER.
(*Weekblad van het Nederlandsch
Tijdschrift voor Geneeskunde.*)

Anosmia.—Our Amsterdam corresponding editor, Professor Pel, sends a description of an "olfactometer," recently invented by Dr. H. Zwaardemaker, of Utrecht, Holland,⁵⁸³_{Aug.} the new name being suggested by him as a better one than "osmometer," which can easily be confused with "endosmometer." The instrument consists of a vulcanized gutta-percha tube (A), which contains the odoriferous substance; a glass tube (B), extending through a screen (E) and turning up at (c) to fit the nostril; and a handle (D), which supports the entire instrument. When the odorous gutta-percha tube is slid over the glass one, the intensity of the odor is proportionate with the length of tube extending beyond the end of the glass tube. In other words, when the two are juxtaposed equally

no odor is perceived by the patient, but as soon as the outer tube is slid over the inner he becomes aware of the odor, the acuteness of his sense of smell being thus ascertained by the number of centimetres shown on the graduated glass tube.

During a discussion introduced by Dundas Grant at the meeting of the British Laryngological Section,³⁶ Dec. Lennox Browne related a case in which the sense of smell returned after amputation of the uvula. Semon had also observed such a case.

Greville Macdonald was inclined to believe that the middle turbinated body was specially reserved for the sense of smell, while the superior was rather for the sense of taste, or flavors. He had had two cases of polypi in which the middle turbinated body was affected—the upper and lower surfaces in one instance, the lower alone in the other. In both the sense of smell was lost, though the taste was unimpaired. Bad odors could be tasted, but not smelled.

DISEASES OF THE SEPTUM.

Deflections and Cartilaginous Tumors of the Septum.—Gouguenheim, our Paris corresponding editor, sends a review of Rosenthal's thesis on this subject¹¹⁵³ which presents many points of interest, his researches having been based upon the examination of a large number of crania. He found deviations most frequent on the left side, most of which were situated in the anterior three-fourths of the cavity, therefore implicating principally the cartilage. Spurs were about equally divided as to side, were also located most frequently in the anterior three-fourths of the cavities, and were generally conical. The portions of the palatine or maxillary bones opposite these growths were almost always deformed. Chatellier, of Paris,⁷ June 8, in a careful microscopical examination of these spurs, failed to find any adventitious or abnormal tissue, bone and cartilage as well as the overlying periosteum and perichondrium being found absolutely devoid of pathological characters.

Jarvis, of New York,⁵⁹ Apr. 23, in a paper read before the New York County Medical Society, presented the following interesting statistics: Of one hundred cases of deflected nasal septum, thirty were deflected to the right and were cartilaginous in character; forty purely cartilaginous deflections were to the left; eight were bilateral deflections; twelve were osseo-cartilaginous, deflected to the right;

five to the left; only three were purely osseous deflections, two of which were bilateral. There was complete stenosis of the right nostril in twenty-nine cases; of the left nostril in twenty cases; in eighteen there was incomplete stenosis of the right nostril; of the left, in fourteen. Thus eighty-one of the cases had stenosis. Of the one hundred cases, in twenty-nine there were marked ear symptoms. Eye complications were marked in eleven cases. There was well-marked catarrhal headache in fifteen; hay fever in eight; bronchitis in seven; polypi in four. In ninety-four there was hypertrophic rhinitis; atrophic rhinitis in two; fetid atrophic rhinitis in four.

Seiler, of Philadelphia,⁵⁹_{Feb. 18} basing his opinion upon a number of cases in which he was able to watch the development of septal ecchondromata, considers them as due, not to external traumatism, as believed by some, but to intranasal local irritation of the septal membrane and of the perichondrium secondarily, through contact with hypertrophied turbinated tissue. The local blood supply is increased, engendering a greater proliferation of cartilage cells and increase of cartilage tissue.

Boucher,¹⁶¹_{Jan.} who is an opponent of surgical measures in the treatment of nasal deviations, reports excellent results with nasal douches of compressed air by means of Waldenburg's pneumatic instrument, a procedure first recommended by Massei, of Naples.

Greville Macdonald, of London,²_{Sept. 15} proposes in the following words what he terms, doubtless through oversight, a new operation, practically the same procedure having been described some years ago by me¹¹⁵¹₁₈₈₃:—

"A single linear incision is made from behind forward down to the cartilage. With a raspator the perichondrium is then turned up and down sufficiently to expose the portion to be removed. Next, the superabundant cartilage is separated with a gouge, or saw if it prove to be ossified. Finally the flaps are allowed to fall together and the fossæ stuffed with iodoform wool, which should remain untouched for twenty-four hours. Healing generally appears to take place by first intention."

Miet, of Paris,¹³⁶_{June 1} recommends galvano-puncture for the reduction of septal ecchondroses, using for this purpose twin needles of steel or platinum of his invention. The maximum limit of the current was twenty-five millampères. The negative pole was ap-

plied to the nose, the applications averaging five minutes and being renewed about every other week. He reports success in every case treated, some of them requiring but three sittings.

Gouguenheim, of Paris, employs for the removal of cartilaginous spurs, or bends, a short bistoury shaped like a scythe and mounted obliquely on the handle. The point of the instrument being passed behind the growth, the latter is shaved off with great ease.

Walsham, of London, ^{Feb. 25} suggested a poro-plastic felt cap to retain nasal trusses. The felt, whilst rendered plastic in the ordinary way by the application of heat in the steam oven, is accurately moulded to the vault of the skull, and there kept in position till cool, when it retains the form of the head. Thus a close-fitting cap is obtained which will shift neither in a horizontal, vertical, nor lateral direction, and in this respect secures all the advantages of the leather mask. At the same time, the porosity of the felt allows of the free passage of the perspiration, and hence the cap does not give rise to any heat of the head. To its front the plate of the nose truss is secured by rivets.

DISEASES OF THE NASO-PHARYNX.

Naso-Pharyngeal Catarrh.—Schwabach, of Berlin, ²⁹ continuing his admirable researches with a view to ascertain the true character of the bursa pharyngea, has determined in a conclusive manner the correctness of his views on the subject, concurring with those of Ganghofner, who in 1878 denied the existence of the bursa pharyngea in the form represented by Luschka. He also demonstrates the fact that it is not a special anatomical formation, as considered by Tornwaldt, of Dantzig, who deemed it the seat of post-nasal catarrh in most cases, but the remnant of the middle cleft of embryonic life, the primary element of the pharyngeal tonsil. This presents considerable analogy with the first traces of the faucial tonsils, which, according to Kölliker, appear in the fourth embryonic month as simple clefts or cleft-like depressions. Schwabach attained his results by studying the histological changes as presented in the various stages of embryonic life, and represented them in a plate, a partial reproduction of which is shown herewith :
1. Embryo, 3.1 centimetres diameter, fornix smooth without depression. Twice enlarged. 2. Embryo, 7.5 centimetres. Recessus

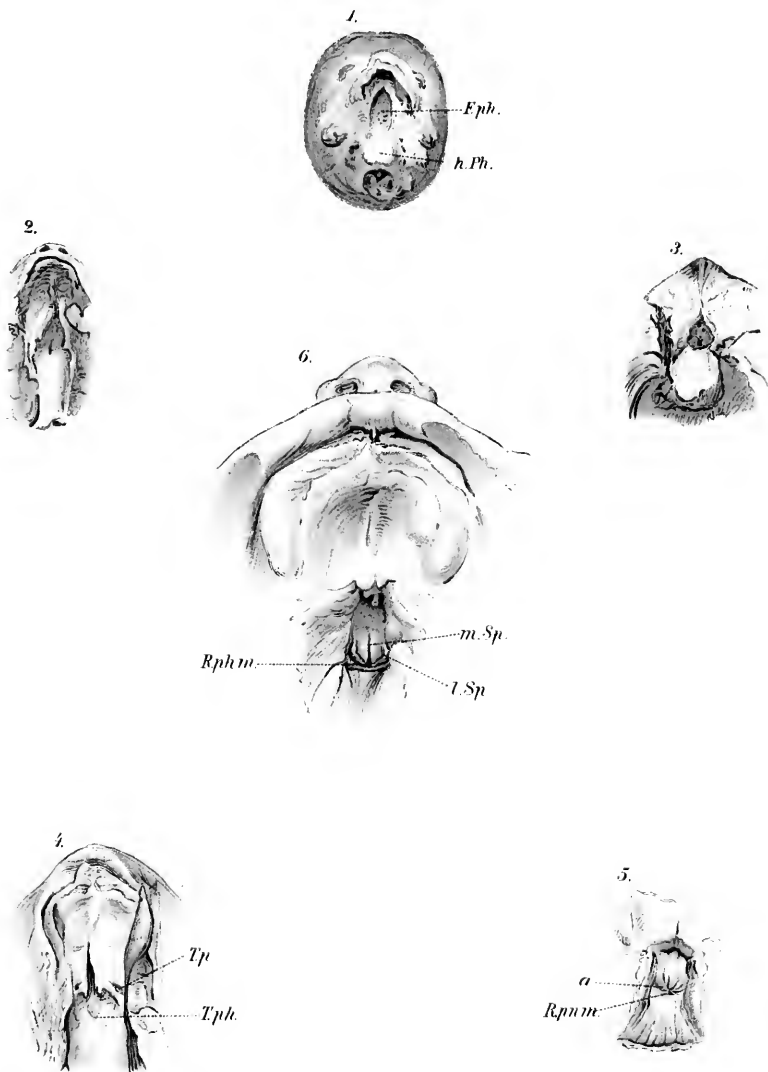
pharyngis medius, shape of fine cleft in centre of fornix, posterior end. Natural size. 3. Embryo, eight centimetres. Recessus pharyngis in form of small groove. Natural size. 4. Embryo, nine centimetres. Indication of side clefts starting from recessus pharyngis medius. Natural size. 5. Fœtus, twenty centimetres. Small connecting piece of mucous membrane between the side cleft and the recessus pharyngis medius. Natural size. 6. Fœtus, twenty-four centimetres. Almost entirely formed pharyngeal tonsil with medial cleft and lateral clefts starting from the recessus pharyngis medius. Natural size.

Buck, of New York, ⁵⁹_{Aug. 18} emphasized the reflex influences as etiological factors in the production of naso-pharyngeal catarrh, especially those emanating from the gastro-intestinal tract. He cites a case in which indulgence in certain articles of food would cause abdominal discomfort and marked exacerbation of the naso-pharyngeal trouble, the relief of the one inducing immediate relief of the other. In another case, uterine difficulties engendered active derangement in the naso-pharyngeal region, the latter disappearing as soon as the former had been successfully treated. These examples represent but the daily experience of every specialist, and serve to indicate the necessity of searching beyond the local condition before instituting treatment.

Nothing new has been suggested during the year on the treatment of naso-pharyngeal catarrh.

Adenoid Vegetations.—Brommer, of Bradford, England, ²_{Sept. 1} reported to the British Medical Association that in an examination of two hundred and fifty school-children he found twenty, or 8 per cent., suffering from adenoid vegetations. In relation to the influence of these growths upon hearing, 85 per cent. of one hundred and twenty-five cases carefully examined showed symptoms of present or past affections of the middle ear.

Lemox Browne, of London, ²_{Sept. 1} made interesting remarks at the same meeting upon the relation of adenoid growths to enlarged tonsils. He had found that not only were there growths where the tonsils were not enlarged, but that in almost all cases of deafness formerly considered due to enlarged tonsils there was co-existence of adenoids, and that failure to cure deafness after tonsillotomy would be less if the vault of the pharynx were always explored and cleared of additional lymphoid overgrowth. It was



Burk & Co. Festschrift, Luth. Pluta.

Pharyngeal Bursa (Schwabeach)

Archiv für Mikrosk. Anatomie

Max Cohen & Son, Publishers. Bonn



also probable that adenoids did not disappear at so early an age as was generally advanced, and several cases were quoted in which they were present and were the cause of deafness in patients more than twenty-one years of age.

An explanation of the proclivity of youth to adenoid vegetations is suggested by V. Uchermann, of Christiana, Norway ³⁶⁹ V. 2, No. 4 (reported by Dr. Eklund, corresponding editor), who considers it due to the greater relative proportion of liquids in relation to weight, a theory which the greater hardness of these growths in adults as compared with children would tend to favor.

E. Weil ¹³³ Aug. 16 expresses the opinion that adenoid vegetations are the cause of a large percentage of children's diseases. He has seen these growths occur not only in the vault but also in the fossa of Rosenmüller and other portions of the pharyngeal wall. Occasionally some were observed starting from the posterior wall, the roof being almost free. He opposes the view that chronic catarrh of the anterior nares in connection with these growths results from impediment of venous circulation, not having found catarrh in his cases. He uses Schütz's forceps with antero-posterior cutting tips, which he finds infinitely preferable to instruments cutting from side to side, although he recommends great care in its employment lest injury of the Eustachian promontory occur.

D. Johnston, of Clarksville, Tenn., ⁹⁹ Apr. 26 recommends the position of the patient, during operation, employed by Dr. Warren, of Boston, when performing staphylorrhaphy. The patient, after being anæsthetized, is placed so as to cause his head to hang forward, the operator being seated on a low stool in front of him. The blood is thus caused to flow out of the nostrils instead of the pharynx.

An interesting article by Hooper, of Boston, ⁹⁹ Mar. 15 is worthy of mention on account of the valuable evidence it presents upon several mooted questions. He considers the danger of blood being sucked into the larynx, so frequently adduced, as purely theoretical where reasonable prudence is observed. As there are no blood-vessels of importance to be wounded, the blood does not come with a gush, but slowly trickles down the œsophagus. He advises waiting until the bleeding ceases before removing another piece of the growth. Hooper further states that he fears to a much

greater degree the lodgment of food in the larynx during the vomiting accompanying anæsthesia, and recommends abstinence from eating before etherization in these cases as strongly as if the operation were one of greater magnitude.

Hovell, of London,²_{Mar.3} having noticed that Löwenberg's and other forceps of the same pattern rendered it necessary to tear away the masses of tissue that became engaged in their grasp below the cutting end, has remedied the evil by having an instrument made in which the entire circumference of the blades was made sharp, the piece of growth being thus cut out completely.

Wright Wilson, of Birmingham,²_{Mar.17} having occasion to remove some vegetations from the sides of the naso-pharynx, modified Hovell's forceps by making the blades cut antero-posteriorly.

Gradle, of Chicago,⁶¹_{Jan.2} presented new forceps which differ from Löwenberg's and other instruments of the same order in the fact that the blades are fenestrated, the pieces of severed tissue being held in the grasp of the instrument by means of side springs, while the handles are furnished with ebony grasps instead of scissor rings. The author claims that his instrument is less clumsy than ordinary post-nasal forceps, while he can operate with it more rapidly than with the curette.



HOVELL'S FORCEPS.
(*British Medical Journal.*)

Two additions to the ordinary palate-hook were presented, one by J. A. White, of Richmond, Va.,⁶¹_{Feb.18} and the other by W. P. Porcher, of Charleston, S. C.,¹¹⁷³ in the shape of a sliding attachment, which renders the instrument self-retaining. Two arms, which end in two rings in the one and pads in the other, are connected with the shaft. These rings or pads, when in position, rest on either side of the nose, just above the alveolar processes, and are easily retained there by the counter-pressure of the retracted palate.

Ménière, of Paris,¹³⁶_{July} reports an interesting case in which intense and daily cephalalgia of twenty-three months' standing, and which had resisted all treatments, was found to be due to adenoid vegetations and turbinate hypertrophies. Removal of the former and galvanic cauterization of the latter brought about complete recovery.

In relation to the influence of climate upon these growths, our corresponding editor, Professor Massei, of Naples, remarks that adenoid vegetations are quite rare in Italy, and that those found seldom present extensive development. Some parts, however, such as Lombardy, seem to be less favored, Kruch⁶¹⁶ having observed twenty cases in that region.

Cartaz, of Paris, ²⁸⁶_{Dec. '87} reports two cases in which the phonetic imperfection accompanying the presence of vegetations persisted after their removal. In one case it continued for one month, although free respiration through the nose was obtained, while in the other the speech was as imperfect one month after the operation as before. Meyer, who had also noticed this result (due to paresis of the soft palate) in one case, only obtained complete recovery in a year's time. Cartaz advises in these cases systematic practice in the proper pronunciation of defective words, and would have used electricity had the phonetic trouble persisted.

Naso-Pharyngeal Polypi.—Dr. Holger Mygind, of Copenhagen, corresponding editor, sends a *résumé* of a monograph by A. C. Grönbech,¹¹⁵⁵ a very thorough review of all the cases of fibrous naso-pharyngeal polypi found in the literature of the subject, containing in addition thirteen new cases, all with microscopical examinations, collected from the hospitals and clinics of Copenhagen.

Grönbech only uses the name "naso-pharyngeal" for polypi originating from the walls of the naso-pharyngeal cavity. Out of forty-one cases where the fibrous character of the tumor was ascertained by microscopical examination, thirty-six occurred in males and five in females, which shows that females are not so absolutely free from this disease as is commonly thought. In twenty-eight out of the forty-one cases the tumors had begun between the ages of twelve and twenty-three, while in three cases they appeared between the ages of ten and eleven, and in five cases after the twenty-third year. In five cases the date of origin could not be ascertained. The tumors sprung from the right or left side of the basis cranii, the author not having found a single case recorded as originating from the middle line. He considers this fact a strong corroboration of the hypothesis that the disease is peculiar to adolescence, at which period the base of the skull develops mostly at its edges, the process of ossification favoring morbid changes.

In the majority of the new cases collected by the author the fibrous tumors contained enlarged vessels. These were found in large numbers toward the surface of the tumors, reaching even the epithelial layer, being here constructed as capillaries, while in the depths they were constructed like arteries and veins, often forming cavernous tissue. In no case was elastic tissue found. The tumors were often found to contain round cells, but these were generally seated in the superficial layers and were undoubtedly a result of irritating influences. The epithelial cells covering the tumors were frequently flattened from expansion of the tumor.

Sometimes the construction of the tumor was changed in recurrence after operation, and the author quotes the case of a man aged fifty in whom the tumor removed by the first operation was found to be of sarcomatous structure, but during fourteen recurrences in six and a half years it assumed the character first of fibro-sarcoma and finally of fibroma.

Among the symptoms of naso-pharyngeal growths the author describes more particularly drowsiness and sleepiness. In one case, that of a boy aged thirteen, it was found that the patient during sleep exhibited the Cheyne-Stokes type of respiration. The author considered this phenomenon as due to fatty degeneration of the heart, his opinion being justified by post-mortem examination in several cases previously seen. This organic change of the heart was evidently the cause of sudden death in two of his cases, and sudden death has been observed by others in cases of naso-pharyngeal growths.

Cerebral symptoms, caused by perforation of the tumor into the cranial cavity, Grönbech found to be absent in seven cases, with autopsies, recorded in literature, and in one of the author's own cases, where the tumor occupied the inferior part of the temporal lobe of the brain. In other cases, however, cerebral symptoms were present where there was no extension of the tumor into the cranial cavity.

Although the author has collected ten cases from literature where spontaneous cure occurred, he does not think that expectant treatment is justified, but urges the removal of the tumor regardless of the age of the patient and without leaving a trace behind. He recommends strongly the treatment by electrolysis, and quotes thirty-two cases treated by different operators, seventeen of which

were cured, even though serious. In one case in which he used electrolysis no trace of suppuration appeared.

Helfferich, of Griefswald, corresponding editor, reports a new operation by G. König, of Göttingen,³³⁶_{Mar.10} which consists in opening the nose proper by an incision near the median line from bridge to tip, and then removing the tumor by means of a large, sharp spoon.

Heydenreich, of Nancy,³_{May 9} criticises König's method as inapplicable to large growths. He also states that the danger of severe hæmorrhage and cerebral complications is increased, and advises great circumspection in resorting to the procedure.

Herbet, of Amiens,²³⁰_{May} removed a pedunculated fibrous polypus from the naso-pharynx by means of a loop of strong thread passed into the nose with a Bellocq's cannula. The finger, introduced behind the soft palate, having adjusted the loop around the base of the growth, the thread ends were fastened to a Graeffe snare, which by a few turns of the milled nut severed the growth (held by forceps) from its seat of implantation.

Tirifahy, of Brussels,⁵²_{May20} describes an operation presenting new and interesting features, which he performed for the removal of a large fibroma of the naso-pharynx, instead of Chassaignac's angular incisions around the nose, when the temporary resection is necessary. He made a curvilinear cut extending from the inner border of the orbicularis palpebrarum to the edge of the nostril of the opposite side. In this manner he avoided the mortification of the angles that sometimes takes place in Chassaignac's operation. He did not, like the French surgeon, separate the flap from the underlying bones, but detached these also, by an oblique section (with the saw) from above downward, including the turbinated portion of the bones traversed, fracture of the maxillary and apophysis on the side not incised with the knife, and detachment of the cartilage of the septum from the sound. By thus preserving the bony frame-work with the overlying soft tissues, its vitality is preserved by the nutrient vessels of the latter, while the normal shape of the nose is restored after the operation. The nose was then turned over on the cheek like the lid of a box. The tumor, brought to perfect view, was thoroughly eradicated by the chisel, and the seat of implantation cauterized. The nose was then restored to its position and sutured with silver wire, then covered with a thick layer of chloroform collodion, highly extolled by the author. But

little bleeding took place. Chloroform was used through the fact that the easy reach of the naso-pharynx rendered perfect isolation of the lower respiratory tract possible, and the patient made a good recovery.

R. Baracz, of Lemberg, ⁵²⁰_{No.32} reports a case of a fibroma the size of a goose-egg, which he removed by resorting to a combination of Koenig's and Furneaux Jordan's operations, the latter consisting, like Rouge's, of separation of the lower portion of the nose and the upper lip from the superior maxillary.

Stonham ⁶_{Jan.7} reports the removal of a naso-pharyngeal polypus in a boy of sixteen with the Paquelin cautery, after preliminary laryngo-tracheotomy and resection of the nose from below upward. Recurrence took place in six months, when the same operation was resorted to with permanent result.

Walden, of Birmingham, ²_{Sept.15} reports a case of multiple gelatinous polypi in which a fibroma, the size of a walnut and surrounded by a small, soft polypus, was found attached to the upper and posterior surface of the soft palate.

Dr. Plà, of Havana, corresponding editor, reports a case of Dr. Saez, ⁴⁵⁶_{Mar.9} in which repeated torsion and evulsion of a large growth was followed by recurrence. A radical operation involving resection of the nose being followed by a similar result, extirpation of the maxillary was resorted to with thorough curetting and cauterization, as in the preceding operations. The recurrences then ceased.

While the array of cases in which formidable measures were adopted make a creditable showing as far as results are concerned, it might be appropriate to recall Lincoln's (New York) review of the literature of the subject, in which he showed that over 25 per cent. died of such operations and that in only 14 per cent. the neoplasm did not return within a year. I must also express my opinion that this likelihood of recurrence should render such operations warranted only when the less formidable operations are impossible or when they have been given thorough trial.

In an interesting article on antiseptic nasal surgery, C. C. Rice, of New York, ¹_{Oct.20} urged the adoption of antiseptic methods in the surgical treatment of nasal disorders in order to obtain more rapid healing and limit the danger of septicæmia. Although Rice alludes to minor operations as well as the more important, it is in

the latter that his recommendation is most applicable, if the details of several of those reported this year are read.

Sarcoma.—Massei, of Naples, corresponding editor, reports the removal by Professor d'Antona, of that city, ⁷³²_{Feb.} of an enormous fibro-sarcoma situated on the back of the velum and causing exophthalmos, in a man aged thirty-six. He reached the growth by an incision from the outer canthus to the left nostril, section of the zygoma and of the maxillary, and removal of the nasal bones of the same side. He quickly removed the mass with his hand, the hæmorrhage being considerable. Complete recovery followed.

Clutton, of London, ⁶_{Dec. 1}, reports an interesting case of sarcoma in a boy of fourteen, in which by means of a strong snare he removed what at first was thought to be a soft fibroma. A bare patch of bone, the size of a shilling, being felt at the junction of the posterior wall and the roof of the pharynx, this was attacked with the sharp spoon, and as the bone crumbled away the finger entered a hole in the basilar process of the occipital bone. Evidences of recurrence having shown themselves a month later, the cavity in the basilar process was enlarged, until it became evident that the sphenoidal sinuses had been reached, and distinct masses of new growth were removed with sharp spoons of various shapes. The vomer being then broken away with Löwenberg's forceps, more of the same kind of growth was scraped away. Microscopical examination, which had revealed wavy fibrous tissue after the first operation, now showed distinct evidence of sarcoma. No recurrence had taken place two years after the last operation.

At a meeting of the Chicago Medical Society, C. S. Bacon, of that city, ⁶¹_{Mar. 24} reported a case of sarcoma in which fourteen operations through the nostrils were followed by rapid recurrence. Ligation of the common carotid at the tenth operation only succeeded in rendering the growth of the neoplasm somewhat slower, removal being even then necessary every three or four weeks. At the last operation galvano-cautery, which had been used in all the others, was not employed, the mass being simply gouged out. Four months after (the time at which the paper was read) there had been no recurrence. Had the galvano-cautery influenced the former recurrences, or was their cessation at the time a mere coincidence? We well know that repeated operations sometimes

result in final cure, but in this case the active process might have found in galvano-cautery an element of stimulation.

Adenoma.—McKenzie Johnston, of Edinburgh,²_{Sept. 15} describes under this title a growth which but slightly differs from the ordinary adenoid vegetation, and which he removed with forceps. Microscopical examination showed it to be “a true adenoma covered by cylindrical epithelium, and containing small mucous cells like those seen in mucous polypus.” W. B. Platt, of Baltimore,⁹_{June 2} reports the removal of a growth of the naso-pharynx which, upon microscopical examinations by Professor Welch, of Johns Hopkins University, proved to be a fibro-adenoma containing occasional cartilage cells.

Hairy Polypi.—Julius Arnold²⁰_{Jan. 5}; ¹¹_{Nov.} reports a case of congenital hairy polypus of the naso-pharynx which he removed with the galvano-cautery loop. He expresses the opinion that hairy polypi are autochthonous teratomata.

REFLEX NEUROSES.

Asthma.—Schadle, of St. Paul,⁵⁹_{July 22} contributes three cases in which asthma of several years' standing was removed by the reduction of nasal hypertrophies. Another case is reported by an anonymous writer,¹³¹_{Mar.} who completely relieved an obstinate case of ten years' standing by scarification of the turbinated bodies with a tenotomy knife.

A very interesting series of ten cases is contributed by W. C. Ayres, of New Orleans,¹²_{Oct.} which adds considerable evidence to the etiological position of the nose in the production of some cases of asthma. The majority of the cases were of long standing, had been vainly subjected to the various forms of treatment usually employed, and yielded only and at once to well-conducted cauterizations of the diseased portions of the nasal cavities. Finally, Bosworth, of New York,⁵⁹_{Sept. 22} in the course of a discussion before the Climatological Society, stated that of eighty of his cases of asthma, forty-two had been cured and thirty much benefited by nasal treatment. In five of these the result was unknown, while only three were not benefited.

Headache.—Roe, of Rochester,⁵⁹_{Aug. 25} calls attention to the frequent dependence of persistent and so-called congestive headache upon abnormal conditions of the nasal passages, and cites a num-

ber of cases in which that treatment induced complete relief. In all of these he found pressure in some portion of the cavities, either through the presence of hypertrophy or enchondromata of the septum, etc., the degree and duration of the pain depending upon the degree and duration of pressure, these in turn being secondary to atmospheric influences or any cause inducing engorgement. Although presenting no new features, these observations are of considerable practical value, emphasizing, as they do, a frequent etiological factor in the production of headaches generally overlooked. The same might be said of an interesting article upon the same subject by Gradle, of Chicago.⁶¹_{Sept.}

Netchayeff⁵³⁰_{Nos. 9, 10} reports a case of cephalalgia, dyspnœa and palpitation following any slight emotion, which ceased as soon as a large inferior turbinate hypertrophy had been reduced by means of chromic acid. (Report of Dr. G. N. Scott, Moscow, Russia, corresponding editor.)

Ménière¹³⁶_{July} reports an interesting case in which intense and daily cephalalgia extending over twenty-three months, and which had resisted all the ordinary measures, was found to be due to adenoid vegetations and adenoid hypertrophies. Removal of the former and cauterization of the latter by means of galvanic cautery induced complete recovery.

Chorea.—White, of Richmond,⁸¹_{May} reported a case in which the removal of adenoid tissue and enlarged tonsils caused the disappearance of choreic spasms of eighteen months' standing in a young girl.

A case presenting some analogy to this was referred to by Netchayeff,⁵³⁰_{Nos. 9 & 10} (report of Dr. G. N. Scott, corresponding editor, Moscow, Russia), in which spasmodic movements of the eyelids were associated with transitory paralysis of the tongue, tingling and stiffening of the fingers and the face (especially the lips), sometimes on one side of the body, sometimes on the other. Cauterization of a large turbinate hypertrophy relieved all these symptoms.

Epilepsy.—E. H. Griffin, of New York,⁵⁹_{July 21} reports an interesting case of reflex epilepsy, in which the attacks occurred once or twice a week, accidentally and completely cured by the removal of a shoe-button forming the nucleus of a large rhinolith in the left cavity.

A case of *petit mal*, with concomitant asthma, is described by

W. C. Ayres, of New Orleans, ¹²_{Oct.} in which relief of septal and turbinate hypertrophies, seated far back, relieved all symptoms.

Neuralgia.—B. A. Pope, of Dallas, Texas, ¹⁹⁶_{Oct.} publishes notes of a case of severe supraorbital neuralgia appearing in the morning and disappearing at night, with great local pain on pressure, concomitant with a peculiar unfitness for any continued mental effort, which at once yielded to treatment of large nasal hypertrophies and a septal ridge.

Paretic Aphonia.—Trifletti, ⁵⁰⁶_{Apr.} in an article on this subject, lays stress upon morbid conditions of the nose and naso-pharynx in the production of aphonia (report of Massei, corresponding editor). Two very interesting cases bearing out this view were reported by W. R. H. Stewart, of London, ⁶_{Oct. 13}. In both the paresis was unilateral, on the right side, the adductors being at fault; in both the right middle turbinated body was much enlarged and pressed on the septum; and in both the laryngeal symptoms disappeared on removal of the nasal trouble.

Ruault, of Paris, ²⁸⁶_{Nov. 15} in an able review of the subject, contributes eight cases in which he obtained a cure by intranasal treatment. In one of these suggestion—the mere application of the mirror to the larynx for examination—sufficed to arrest the glottic spasms for some time, when proper treatment of the nasal was instituted. He considers women, especially hysterical ones, particularly predisposed to the affection, although it may show itself in both sexes and without the existence of hysteria. Children, as shown in his list of cases, may also be subject to spasm of the glottis finding its origin in a nasal affection. Along with the laryngeal spasm a bronchial spasm may also be observed in some cases, while vocal disabilities between the attacks may also find their origin in the nose. As to treatment during the attacks, he suggests the application of strong solutions (20 per cent.) of cocaine, chloroform inhalations, with tracheotomy as a last resort.

Stammering or Stuttering.—Farquhar Matheson ²_{Aug. 8} read a paper on the relation between naso-pharyngeal diseases and stammering and stuttering, which showed that this latter condition was caused in many cases in early life from growths and diseases of the nasal cavities. Several cases were related in which the removal of adenoid growths from the naso-pharynx completely cured the stammering and stuttering. The conclusions based on these and

other cases were: (1) that stammerers were, as a rule, of a neurotic temperament; (2) that one of the following conditions was a constant factor in cases of stammering, namely, enlargement of the turbinated bones, adenoid vegetation in naso-pharynx, chronic rhinitis. The explanation given showed that the spasmodic motion of the muscles of the throat was due to reflex irritation. The connection between naso-pharyngeal disorders and stammering is also emphasized by Freudenthal, of New York.³¹²
Nov.

Ocular Disturbances.—Gruening, of Philadelphia,⁶²
Feb. 6 states that he relieved one hundred and fifty cases in which direct treatment of the eyes had proven inefficient by attention to the nose. Common features observed in these cases were burning and smarting sensations in the eyes, inability to fix vision, increased vascularity of the conjunctiva, and absence of important lesions in the eyes and their appendages. (See Section B, this volume.)

Goitre.—Fränkel, at a meeting of the Berlin Medical Society,³⁴
Jan. 24 reported a case of goitre with murmur and a pulse of one hundred and twenty, in which reduction of large hypertrophies of both inferior turbinated bodies caused rapid diminution of the enlarged thyroid gland and return of the pulse to the normal.

Spasm of the Œsophagus.—Our corresponding editor, G. N. Scott, of Moscow, mentions a case reported by Netchayeff⁵³⁰
Nov. 9, 10 in which spasm of the œsophagus accompanied by intense dyspnœa had been the almost constant accompaniment of deglutition, especially of liquids, for fifteen years. These were found to be due to hypertrophy of the right inferior turbinated body and inflammatory thickening of the right side of the pharynx. Cauterization of these parts obtained rapid recovery.

Spasmodic Sneezing.—Our English *confrères* have again contributed several cases of this condition. A. W. Stanford, of Newcastle-on-Tyne,²
Mar. 17 mentions a boy ten years of age who sneezed uninterruptedly (with the exception of a few hours' sleep at night) every fourth second, for ten days, resisting every treatment. R. J. Lee, of London,²²
Jan. 11 relates a case of a girl of fifteen who, after the extraction of one of her double teeth, began to yawn and continued to do so for a period of five weeks, except during sleep. It then stopped suddenly, to be replaced by sneezing, which could only be arrested by anaesthesia, to return with greater violence when the chloroform was withdrawn. This lasted a week longer.

Another decayed tooth being withdrawn some days later, yawning again returned, lasted a week, and suddenly ceased. It was noticed that while she was in bed both the sneezing and yawning were less frequent and violent. A. S. Gubb, of Hammersmith, W., England, ^{Jan. 25} reports another case, a girl of sixteen, who, without appreciable cause, was seized with persistent sneezing, which continued off and on for six weeks, ceasing during sleep. The fact that her menstruation was scant and irregular might suggest the reproductive apparatus as initial cause, as shown by John Mackenzie in 1883. Sydney Ringer and W. Burrell, of London, ^{June 13} give a valuable review of the subject and a long list of cases seen by them. Many remedies are suggested, among which, however, nothing particularly new can be found.

HAY FEVER.

Hay Fever.—A very interesting paper upon this subject was read before the British Medical Association by P. McBride, of Edinburgh, ^{Sept. 15}. After hastily reviewing the different theories advanced, he suggests that in cases in which an undue tendency to erection on the part of the nasal mucosa exists we should seek the etiology in one or more of the following conditions: (1) general neurasthenia, or a neurotic temperament; (2) organic changes in the nose; (3) hyperæsthesia of the nasal mucosa. As to the production of asthma, he submits as hypothesis the possibility of contraction and expansion *per se* of the trachea and bronchi, actions resembling those of the glottis during the act of respiration, the asthma resulting from want of proper correspondence as to contraction and dilatation in different parts of the respiratory tract. As to treatment, he would look upon it as indicated when the application of the probe induces reflex symptoms, cough, or asthma. It should correspond in energy exactly in proportion to the amount of discomfort caused by the abnormal condition, efforts being first directed toward the nervous element, followed up by cocaine and cicatricial binding down of erectile tissue by galvano-cautery if these steps become necessary.

Concerning the views of Daly, Roe, etc., the invariable presence of some nasal abnormality, he puts the question, "What is a normal nose?" and notes the fact that thousands of persons present abnormal conditions of the nose without experiencing the

least discomfort. Roe's reported successes he ascribes to a "very high ideal of what the interior of the nose ought to be," and energetic measures in proportion, but he also notes the fact that "it is not uncommon to meet with hay fever in persons in whose noses even the most fastidious stickler for the ideal would find it difficult to discover objectively a pathological condition," and considers the undue sensibility of the nasal mucous membrane as caused by local or general hyperæsthesia, citing a strong case to support his opinion. Here I cannot refrain from referring the reader to an article written by me, some years ago,¹⁹₁₈₈₃ which led me, later on, to suggest the term *hyperæsthetic rhinitis*, instead of "hay fever."

Pathology.—McBride, referring to the benefit obtained from the formula suggested last year by Sir Andrew Clark (ANNUAL, issue of 1888, page 268), ascribes it to the local anæsthesia induced, and states that "it might be worth considering whether the use of the pure acid (carbolic) might not be serviceable in certain cases." I must again refer to the paper mentioned, in which local applications of glacial acetic acid are recommended and through which a number of permanent cures were obtained when no other pathological condition existed than hyperæsthesia, a condition which Kitchen, of New York,⁵⁹_{Dec. 1} defines as being due to the presence of "a thin, delicate mucous membrane seemingly deficient in connective fibres and epithelial covering, the vulnerability of which to special irritants could readily be imagined." In a great majority of the cases studied by this author "the nervous element was not sufficiently marked to warrant the belief that without concomitant intranasal hyperæsthetic conditions there would be susceptibility to irritation from pollen, etc." To term hay fever a *neurosis* he considers as scientifically incorrect, the disorder being not a disease *per se*, but "a higher development of the common property of receptive sensitiveness than is normal in every normal individual," the presence of a true neurosis or hysteria in such an individual being but a predisposing cause and an aggravating complication. In an interesting article based upon a large number of observations, R. H. Thomas, of Baltimore,⁴⁶² while admitting that a neurosis when present is "undoubtedly a very important factor in sustaining and increasing the violence of the attacks," maintains that "neurasthenia, or any condition of the nervous system, is not of itself the necessary predisposing cause." The nervous element is "a

peculiar condition in the nerve-endings, or, perhaps, in the nerve-centres, that renders them liable to take on excessive or perverted action when exposed to certain forms of irritation;" in other words, an idiosyncrasy, a term which our present knowledge does not warrant us to cast aside. Obstructive diseases (polypi, hypertrophies, deflected septum, etc.) Thomas considers as not being principal factors in the production of an attack, even going so far as to state that in one of his cases the symptoms were generally ameliorated when the nasal passages became occluded. He believes, however, that their presence may greatly aggravate and prolong the access. As to reflex sensitive areas, they may exist in any part of the cavities.

Leflaive, of Paris, ¹⁰⁰_{Mar. 24} suggests another name to replace that of hay fever—"annual rhino-bronchitis," which presents the advantage of avoiding prejudgment of the nature of the affection, while giving a fair insight into the symptomatology of the affection. This author analyzed the urine to find uric acid in great quantity just before the attack and half that quantity during the attack, causing him to suggest a gouty diathesis as an etiological factor, the periodical access of the affection being ascribed to meteorological influences. Lermoyez, ³⁷_{Mar.} in a criticism of the above, objects to about everything that has been done of late, including Hack's observations and theory, and ends his paper by definitely separating hay fever from the class of reflex neuroses of nasal origin.

Directly in opposition to these views are those of B. O. Kinnear, of Boston, ⁵⁹_{July 14} who endeavors to show that hay fever in its immediate symptoms may be accounted for by an abnormal condition of central nerve-cells. Assuming that the masses of gray matter composing the centres of the fifth, the glosso-pharyngeal, the facial nerves, and some of the pneumogastric are hyperæmic and therefore acting excessively during an attack, he instituted a treatment having for its object to diminish this hyperæmia, and obtained successful results in a number of cases. This hyperæmia of the nerve-centres he ascribes to summer heat, and considers the pollen of plants, smoke, dust, etc., as but aggravating causes which bring on the attacks by reflex action.

Treatment.—That adopted by Dr. Kinnear consisted in applications over the spine (these applications lasting an hour or one hour and a half) of ice-bags of different lengths (Dr. J. Chap-

man's, of Paris), filled with small pieces of ice, one to three times a day, according to the requirements of the case. Applied between the fourth cervical and the third dorsal vertebrae it will cause dilatation of the arterioles of the whole body, evenly distributing the circulation and withdrawing from the excited centres their excess of blood. A ten-inch bag used over the cilio-spinal region will dilate the blood-vessels of the whole head, rendering the circulation in the previously hyperæmic centres normal. In violent forms it is necessary to withdraw the excess of circulation not only from the nervous centres, but from the whole head. This may be done in most cases by dilating, by means of a dorso-lumbar Chapman ice-bag, the blood-vessels in the body and lower extremities, thereby allowing the blood to flow in normal amount to this region, and removing from the hyperæmic head, brain, and centres the superfluity of blood within them. This may be accelerated by using ice or ice-water in a rubber bag over the base of the brain. Genth, of Langen-Schwalbach, ²_{June 16} in view of the fact that in many cases the initiatory manifestation was at the conjunctiva,—twitching, pruritus, conjunctivitis, etc.,—advised bathing of the eyes with a one in three thousand sublimate solution a couple of weeks before the impending attack, whenever the patient returned home after open-air exercise, with considerable relief as a result. This is further corroborated by S. P. Paget, of London, ²_{July 26} who gently bathes the inner canthi with a 1 per cent. solution of cocaine frequently during the day—a treatment which greatly tends to retard and perhaps prevent the intense pruritus. For the nose, C. R. Illingworth, of Accrington, ²_{Nov. 3} recommends a one in two thousand solution of biniodide of mercury, applied with douche or atomizer.

Bigg, of Dover, ²_{July 28} advocates a method of treatment which consists in spraying the palate and throat, both prior and subsequent to entering any graminaceous district, with a lotion of equal parts of a 5 per cent. solution of cocaine and of carbolic acid of the strength of one in one hundred and twenty. Two small pieces of clean sponge soaked in this solution are lightly inserted into either nostril, and the eyes are bathed with a collyrium of corrosive sublimate (one in one thousand) and sulphate of zinc, two grains (0.066 gramme) to one fluidounce (30 grammes). A tonic of five drops of Fowler's solution of arsenic, in combination with two grains (0.066 gramme) of iodide of potassium and twenty drops of

aromatic spirits of ammonia, in an ounce (30 grammes) of water, is given three times a day.

DISEASES OF THE ACCESSORY CAVITIES.

Empyema of the Antrum of Highmore.—Ziem, of Dantzig,³⁸⁵_{No.9} in reporting two cases of peritonsillitis apparently originating in purulent intranasal disease, one of which was complicated with disease of the antrum, shows that an abscess may break through either of its walls and implicate not only neighboring but distant parts. He relates a case⁴_{No.37} in which glaucoma of one eye had occurred as a result of antral abscess, the fact being demonstrated by the immediate recovery of the other eye, which was rapidly following the course of its mate, as soon as the abscesses (both sides) had been evacuated.

Another case in point is that of T. F. Prewitt, of St. Louis,⁸²_{May 5} in which an empyemic antrum was found to be connected with the frontal sinus through the orbital plate, which had been partly absorbed, the pus causing fluctuation about the eye. Bulging and erysipelas complicated the case.

Krieg,¹³³_{Nov.1} in twenty-three cases, found empyema of the frontal sinus in three, empyema of the ethmoidal sinus in two, necrosis of the ethmoid bone and orbital abscess in one, and abscess of the pharyngeal tonsil and empyema of the frontal sinus in another. Polypi were present in four. In all but one case the entire abscess was due to carious teeth.

Ziem,³⁸⁵_{No.9} basing his opinion upon the treatment of two hundred and twenty-two cases, much prefers emptying the cavity of its contents by means of the drill passed through the alveolar process near a tooth, or in the socket of an extracted tooth. Mickulicz's operation (Zuckerkancl's)—perforating the thin part of the antrum below the interior turbinate bone—he considers more difficult and painful, besides entailing more hæmorrhage. This opinion is shared by the majority of authors, Walle, of Bonn,¹¹_{May}; Krieg,¹³³_{Nov.1}; Guye, of Amsterdam,¹³⁶_{Nov.1}; Schiffers, of Liège,³_{Sept.19}; Schmiegelow,³⁷³_{Feb.} and others. Brommer, of London,⁶_{Aug.25} prefers reaching the antrum through the interior of the nose, owing to the constant dropping of pus into the mouth when the alveolar process is opened. McBride, of Edinburgh,³⁶_{Apr.} in an interesting paper, drew attention to the fact that a marked redness of the gum, corresponding to the

diseased antrum, may generally be observed. Link, of Lemberg,⁸⁴ Aug. 4 describing four cases in which he performed Mikulicz's (Zucker-
kandl's) operation, stated that he had found what he thought to
be a new diagnostic sign, which consisted in determining by per-
cussion of the hard palate whether the antrum was empty or
whether its contents were fluid or solid. Bayer, of Bruxelles,³ Sept. 19
alluded to a procedure which he had first recommended, having for
its object to determine the presence of pus in the antrum, and
consisting in leaning the head over so as to allow the pus to run
out through the nasal orifice into the nasal cavity.

Dropsy of the Antrum.—A case of this rare condition was
reported by Quénu, of Paris,⁹¹ May 10, resulting from a decayed tooth.
It was evacuated by an opening through the gum, which opening,
having become a true fistula, was closed by a flap taken from the
lip and alveolar membrane. The closure of the fistula was criti-
cised by Després, of Paris, who cited a case of Demarquay's in
which a frightful ozæna followed the procedure. The opening, on
the contrary, should be kept open by means of a silver stylet
left *in situ*.

Tumors of the Antrum.—A case of fibroma and one of sar-
coma of the antrum, both removed by extirpation of the superior
maxillary, are reported, the first by Bennett, of Pembroke-shire,
England,⁶ Jan. 14, the second by J. C. Warren, of Boston.⁹⁹ Oct. 18

Symptomatology of Diseases of the Sphenoidal Sinus.—The
limited amount of information at our disposal upon this class of
diseases led E. Beyer, of Gratz,¹²⁶ July to collect all the cases of sphenoidal
disease verified by autopsy that he could find in literature,
with a view to improve our knowledge of their symptomatology.
He found that caries and necrosis present the following group of
symptoms: (1) sudden unilateral blindness, with phlegmon of the
orbit, the origin of the blindness being perineuritis of the optic
nerve in the optic canal; (2) slow detachment of fragments of bone,
without ocular troubles, and, finally, meningitis; (3) sudden dis-
charge of a large quantity of bone by the nose; (4) fatal hæmor-
rhage after perforation of the wall between the sphenoidal and the
cavernous sinuses; (5) retropharyngeal abscess; (6) thrombosis of
the sinus and of the ophthalmic vein, due to thrombosis of the
circular venous sinus of the *sella turcica*; (7) perforation of the
inferior wall of the sphenoidal sinus, without any other symptom.

In cases of tumors of the sphenoidal sinus, four periods can be distinguished: (1) when the tumor is limited within by the walls of the sinus, there may be no symptoms, or cephalalgia only; (2) when the tumor, by its growth, dilates the walls of the sphenoidal sinus, producing their atrophy and compressing adjoining organs: the compression may involve one or both optic nerves and produce amaurosis; (3) when the tumor may propagate beyond the walls of the sphenoidal sinus: it may extend into the naso-pharyngeal cavity, into the ethmoid cells, into the orbit, and, finally, into the cranial cavity: perforation of the base of the cranium may occur without any symptoms or may excite very grave cephalalgia; (4) metastases are observed in various organs. Epileptic seizures often take place. If the tumor grows rapidly, then meningitis or cerebral abscess occurs soon after perforation of the base of the skull.

Wounds of the sphenoidal bone may produce the following symptoms: (1) in fissures of the superior wall of the sinus, continuous trickling of cerebro-spinal fluid; (2) rupture of a fragment of the body of the bone may wound the internal carotid to the inside of the cavernous sinus and cause pulsating exophthalmia; (3) continuation of the fissure in the canal of the optic nerve will cause compression or rupture of the optic nerve and, consequently, amaurosis; (4) if the fissure extends to the oval or round foramen, it will produce anæsthesia of the second and third branches of the trifacial, and a rupture or wound of other and cerebral nerves may present simultaneously.

Dropsy of the Frontal Sinus.—Elschnig, of Vienna,⁸¹ Apr. 7 showed a case in which a traumatic history of traumatism existed. The characteristic swelling with ptosis were present, these being relieved after opening the sinus had given vent to the contained liquid. Another case presenting considerable interest was reported by Gross, of Nancy, France,¹⁸⁴ Aug. 15 in which a fluctuating tumor above the root of the nose, causing no change in the color of the skin, was found, upon being punctured, to contain a dark, colloid liquid. The infundibulum, carefully searched for, could not be detected, rendering the assumption that it had been permanently closed through catarrhal inflammation quite probable. Although the nasal opening was not re-opened, there was no recurrence of the trouble.

DISEASES OF THE PHARYNX, TONSILS, AND UVULA.

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DISEASES OF THE PHARYNX.

Retropharyngeal Abscess.—Ingals¹³⁹_{Dec. '97} reports an interesting case of retropharyngeal abscess in a woman of forty-four. Two months after the appearance of the abscess it was opened. Four months later there existed a fistulous opening at the base of the tongue, down which a small elastic catheter was passed for a distance of thirty centimetres, when the patient complained of its extremity causing pain in the neighborhood of the right breast. The position of the lower end of the fistula seemed to account for the enfeebled respiration noticed at the lower third of the right lung. It seemed probable that when the lower part of the sac was filled with pus it might be possible to detect it and make a counter-opening through the chest-wall, whereby constant drainage could be established, so that healing of the fistula might be effected.

Burckhardt³³⁶_{Jan. '98} objects to the opening of these abscesses in the usual way because of the impossibility of using proper antiseptic precautions and anæsthesia, and of the difficulty in keeping the incision open until the cavity has healed, and advises that an opening be made from the outside of the neck. This operation he believes to be reliable and to have the advantage of permitting easy digital exploration of the cavity with the finger. The dissection required to reach the seat of the difficulty is somewhat complicated.

An incision is made along the inner border of the sternomastoid muscle, through the skin and platysma, at the level of the larynx, exposing the vessels running to the thyroid gland at the level of the thyroid cartilage. These are pushed outward, and then, by keeping close to the larynx, the inner circumference of the carotid artery can be readily reached in the loose connective tissue without using the knife. At this level no vessels are given off from the inner circumference of the carotid. A small opening is now

to be made with the knife, deep down and close to the larynx, at the lower level of the pharynx, into the thickened connective tissue surrounding the abscess, and to be dilated with a delicate dressing forceps or other similar instrument. Sometimes a larger or smaller subcutaneous vein communicating with the vessel of the thyroid gland is found under the platysma, and this should be secured with two ligatures and be divided before penetrating into the deep portion of the wound. Three cases thus treated successfully are detailed—one in a servant-girl twenty-nine years of age, the second in a servant-girl twenty-six years of age, with a splinter of glass in the abscess-cavity, and the third in a male infant of seven months.

Under the sententious title, "Acute Infectious Phlegmon of the Pharynx," Senator⁴_{Jan.30} describes a condition which he considers rare, and heretofore unrecognized. In the discussion upon the paper it was shown by Virchow, Guttmann, and Sonnenburg that the disease was not so rare as Senator had claimed; that it had been described by many authors, especially by the French, and that it was a condition similar to that described by Mackenzie as acute œdema of the pharynx and larynx accompanying erysipelas of these parts. Articles upon the same subject have appeared by Hager⁴_{Mar.19} and by Landgraf.⁴_{No.6}

Hæmorrhagic Pharyngitis.—Janison²_{Apr.21} calls attention to a condition in which slight hæmorrhages from the pharyngeal and nasal mucous membrane are associated with torpidity of the liver. Treatment should consist of an unstimulating diet, general tonics and aperients, and, locally, the application to the parts of a solution of carbolic acid, half a drachm, and glycerine, one ounce.

In an excellent article upon "Primary Erysipelas of the Pharynx," Cardone, of Naples,⁵³⁷_{No.10} gives a good *résumé* of the literature and reports four original cases. His bacteriological observations are interesting. He found the streptococcus erysipelatosus of Fehleisen, cultivated them, and inoculated them upon rabbits with success.

Tumors of the Pharynx.—The history of this class of affections for the year contains several interesting cases. Among them may be mentioned the following:—

Felici¹¹_{Aug.} reports a case of granuloma or sarcoma of the pharynx. A large tumor springing from the posterior wall of the pharynx covered the arytenoid cartilages. The tumor, after simple traction,

was pulled away, and the microscopical examination showed it to be of a sarcomatous nature. The patient died shortly after. In consequence of the co-existence of syphilis, the recognition of the true nature of the disease was certainly not easy.

Poncet¹⁰⁰_{June 14} reports a case of adenochondroma of the palatine arch in a man, aged fifty-seven, who had a tumor weighing one hundred and fifty grammes, and who died from asphyxia some hours after his admission to the hospital.

Our corresponding editor, Dr. Levison, of Copenhagen, sends the details of a subhyoid pharyngotomy performed by Møller, of Aalborg, Denmark.³⁷⁵_{July 21} The growth, consisting of four divisions, each the size of a small noma, originating with a broad base from the left edge of the epiglottis, was removed through a five-centimetre-long transverse incision in the thyrohyoid space in a man, aged thirty-two, in whom attempts to remove the growth *per vias naturales* had previously failed. The operation was preceded by tracheotomy, and the tracheotomy wound was afterward sewed up, but the development of a considerable emphysema after the operation forced the operator to reopen it. The patient recovered speedily. Only a very slight hoarseness was left when he was seen last, about a month after the operation.

Porter⁶¹_{July 21} reports three cases of supraepiglottic benign neoplasm, namely, a cyst of the posterior pharyngeal wall, a papilloma attached just below the left tonsil, and a chondroma of the epiglottis. All were adults.

Lehmann⁷⁵⁵_{Bd. 36, H. 1} describes a large congenital cyst of the bursa pharyngea in a boy, four years old, who was shown to the author on account of a tumor in the pharynx, behind the velum; the tumor was of the size of a walnut. It was extirpated with scissors, and a honey-colored mucous fluid exuded. The microscope showed that the cyst was lined with cylindrical epithelium, and that the wall consisted of adenoid tissue.

Pilose Tumors of the Pharynx and their Relation to Teratoma.—Under this title Arnold²⁰_{Jan. 5} has written an exhaustive article upon this interesting and hitherto little-known anomaly. To the thirty-six instances which he has tabulated from German and English sources several additional cases might have been added had the writer been familiar with American literature. With regard to their origin, he concludes that those should be considered hetero-

genic teratoma in which the origin can be traced to the secondary development of already existing embryonic elements, while those are autogenic which originate from the development of abnormal embryonic elements or from the misplacement or dislocation of abnormal embryonic elements or from the misplacement or dislocation of normal ones.

Breda,¹²³³ in a pamphlet on the "Anatomy of Lupus of Mucous Membranes," gives interesting details on the frequency of the disease and the possibility of manifestations before those of the skin. The mucous membrane of the nose and throat are the first attacked, and from hence the neoplasm, by continuity of tissues, extends to other organs, *e.g.*, the ear, the nose, the eye. It is very seldom complicated with inflammatory or ulcerative processes, but in the hypertrophic form the consequences (retraction, narrowing) are serious. (Reported by Dr. Massei, corresponding editor.)

Kümmell⁶⁹_{Nov. 8} exhibited a patient upon whom he had successfully operated for the removal of a sarcomatous growth from the right tonsil and the wall of the pharynx.

Resection of the Pharynx.—At the June meeting of the Royal Academy of Medicine of Turin, Carle²⁵_{Sept. 20} showed two patients upon whom he had performed the operation of resection of the pharynx for carcinoma, taking away the posterior and one of the lateral walls. The operation was performed after a method of his own, with a view of avoiding the disadvantages of the plans hitherto adopted—namely, the restricted space for operating and the secondary contraction of the jaws. The method adopted consists in an incision from the lobule of the ear vertically downward to the anterior border of the sternomastoid, and from that a second parallel with the body of the lower jaw; then the lower jaw is disarticulated or resected. In this way sufficient space is obtained for operating, very little deformity remains, and the subsequent contraction of the jaws is avoided.

Iversen,³⁷¹_{Vol. 19, No. 3, 767} in a valuable paper on resection of the pharynx, first gives an account of the course of six cases of this operation, described by him.⁷⁵⁵_{v. 31, pt. 3} The first was that of a woman, aged thirty-four, with carcinoma of the pharynx. She died six months after operation from a local recurrence of the growth. The second, a woman aged fifty-one, died in nine months, and the third, a woman aged forty-eight, died in four months, both from local

recurrence. The fourth, a woman aged fifty-six, operated on for cicatricial stricture of the gullet, is still living, in good health. The fifth, a woman aged forty-four, with carcinoma of the pharynx, in whom also the whole larynx was removed, died thirteen months after the operation from septicaemia arising from a small operation performed on the trachea to extend the opening for the cannula; the post-mortem revealed no recurrence. The sixth case was that of a woman, aged forty-eight, in whom also the whole larynx was removed; the patient had a recurrence of the growth thirteen months after the operation, but died from septic pleurisy caused by perforation of the œsophagus with the feeding-tube, liquid food entering the right pleural cavity. The post-mortem showed that the lower part of the œsophagus was extremely atrophied from disease and the walls very thin. The fissure caused by the feeding-tube was four centimetres under the aortic arch. In all the cases heretofore described, as well as in four recent ones, the operation was performed by subhyoid pharyngotomy preceded by deep tracheotomy. When the pharyngeal growth, which in most cases is situated very low, extending also to the upper part of the œsophagus, is more or less circular, occupying also the posterior surface of the larynx, Iversen makes a long vertical incision in the middle line downward from the transverse subhyoid incision, and also removes the whole larynx, partially to make the operation as radical as possible, and partially because it is difficult to remove the growth radically without lesion of the recurrent nerves, which, when put out of function, render the larynx useless to the patient. The author lays great stress upon performing the tracheotomy as low down as possible, so that there shall be a broad bridge of skin between the opening for the tracheal cannula and the opening to the large wound. He also advocates strongly the use of iodoform gauze in dressing the wound. Space does not allow us to enter into further details of the operation, which appears to have been performed with great surgical skill, and we must refer readers wanting further information to the original articles. Of the four cases never described before, the first was a woman, aged forty-nine, who about eleven months previously had begun to suffer from difficulty in deglutition. There were swollen glands in both lateral regions of the neck, and the patient exhibited a cachectic appearance. The lower part of the pharynx and the upper part of the œsophagus

were occupied by a carcinomatous growth (shown microscopically to be epithelioma); the larynx only showed slight congestion and tumefaction. In this case the diseased parts of the pharynx and the œsophagus, the whole larynx, and the left lobe of the thyroid gland were removed. The patient died thirty-seven days after the operation from multiple bronchopneumonias and small abscesses in both lungs.

The second new case was that of a woman, aged twenty-seven, whose symptoms had only lasted two months. In this case the cancer (shown microscopically to be epithelioma) also occupied the posterior surface of the cricoid cartilage, the lower part of the pharynx, and the upper part of the œsophagus. Besides slight general congestion of the larynx there was found by the laryngoscopical examination slight œdematous swelling over the right arytenoid cartilage. The operation was performed as in the former case, the whole right lobe of the thyroid being also removed. Death occurred thirty hours after the operation from collapse. No post-mortem examination was allowed.

The third patient was a woman, aged forty-six, who had felt the first symptoms half a year previously. In this case the growth, which was shown microscopically to be an epithelioma, extended to the right arytenoid cartilage on the right aryepiglottic fold. By the operation the lower part of the pharynx, the upper part of the œsophagus, and the whole larynx were removed, but it was not possible to reach the lower edge of the growth in the œsophagus. The patient died eight days after the operation. The post-mortem examination showed parenchymatous degeneration of the organs (septicæmia? iodoform poisoning?)

The last case was that of a woman, aged thirty-four; symptoms having lasted four months, with epithelioma (microscopical diagnosis) beginning at the top of the epiglottis, and extending so far down that the lower incision in the operation was made at the lower level of the first dorsal vertebra; besides the whole larynx, a part of the left lobe of the thyroid gland was removed. The laryngoscopical examination showed the larynx entirely free from any symptoms. The patient was still alive (February, 1888) fourteen months after the operation, and doing well.

It will be seen that all the patients were women between the ages of twenty-seven and fifty-one. In all the four cases not de-

scribed before, and in most of the other cases, the growth was low down in the pharynx. It seems to be difficult to determine how far down in the gullet the growth extends, the examination with tubes giving unreliable results. Inspection through the mouth and external examination of the neck often give no result; sometimes, however, the larynx is more prominent than is normal. Swelling of the glands of the neck seems to occur late. Examination by the laryngoscopical mirror and digital exploration are the most important diagnostic means. The symptoms are very marked: dysphagia, pains in the throat, often radiating to the ears; expectoration of mucus and blood, and emaciation. (Report of Holger Mygind, Copenhagen, corresponding editor.)

TONSILS.

Development and Growth.—The whole subject of the growth and development of the tonsils has just been carefully studied by Retterer.¹⁶⁵
Sept. His statements are to the effect that the tissue elements of the tonsils proceed both from the epiblast and from the mesoblast, the former supplying the cellular elements, the latter the connective-tissue septa, the blood-vessels, and probably also the lymphatics. While in most glands the basilar layer of the epithelium forms the whole of the involution, in the tonsils the whole thickness of the epithelial investment proliferates. In most glands, again, the primitive invagination remains as the excretory canal, but in the case of the tonsils the primitive involutions form the crypts or diverticula lined by a layer of pavement epithelium. Another curious point is that the tonsils are homologous with the bursa fabricii of birds, both as to their origin, development, and structure. During the greater part of their existence the epithelial elements of the tonsils preserve the general form and characters of the basilar cells of the epithelium, but toward the close of life they disappear by fatty degeneration, and alveoli make their appearance. In the adult the lymphatic system occupies the whole thickness of each lobule; it forms a net-work of canals lined with endothelium. The walls of these lymphatics are everywhere perfectly closed, and do not open into the connective-tissue reticulum either by stomata or by open extremities. The memoir is accompanied by many well-executed drawings of the tonsillar region of the horse, pig, dolphin, cat, dog, rabbit, and other animals, as well as of man.

Physiology.—The hitherto neglected question as to the physiological rôle of the faucial tonsils has lately been taken up by several English writers, with results which, if not convincing, have at least attracted attention. Following the theory advanced several years ago by Hingston Fox, namely, that the function of the faucial tonsils is essentially that of absorbing the buccal secretions, and so preventing fluid waste in the economy and the manufacture of leucocytes, Seanes Spicer^{6 Oct. 27} argued that the pharyngeal and lingual tonsils and the follicles of the pharynx hold a similar position with reference to the spent nasal and lachrymal secretions. He endeavored to show, from clinical and pathological observations, that through alteration of the normal secretions inflammation and hypertrophy of the tonsils are excited, and he believes that in this theory we have a satisfactory explanation of the pathology of retronasal growths. In view of the above, he believes that the chief indication is the insuring of physiological rest for the tonsils by drying up or lessening the amount of secretions with which they had to deal, or by removing from these secretions any irritating components. Besides this, all causes of irritation in the inspired air and in the ingesta must be removed, and any morbid diathesis attended to on general principles. Further, any hypertrophy occluding a physiological channel, or irritating mechanically by its presence, must be removed by some of the numerous approved methods now available. The paper concluded as follows: 1. The significance of the various tonsils is in their physiological relation to the blood-manufacturing system and to the outpour of copious secretions which they reabsorb. 2. If any of these secretions become contaminated in any way with irritating matters, whether generated in the system or introduced from without, those tonsils in physiological correlation with the affected secretion show irritative changes varying in degree. 3. The functions and affections of the various tonsils afford the keynote to the comprehension and scientific treatment, and to the prevention of recurrence, of many of the most intractable and otherwise recurrent disorders of the nose and throat.

[In reviewing this turgid article the views of the author seem highly theoretical and far from proved. It is to be hoped that further research may throw greater light upon the subject.]

Tchankovsky, writing upon the infectious nature of primary

acute catarrhal angina, ⁵³⁰_{No. 11} states that of three hundred and eleven cases of acute catarrhal angina he found in 3.5 per cent. the cause to be various injurious agents affecting the mucous membrane; in 13.8 per cent. the cause was cold, and 82.7 per cent. the cause was not known. These last cases impelled him to investigate the contents of the tonsillar crypts during the progress of the illness. The clinical features of the disease are, high fever for three or five days; temperature 40° to 41° C. (104° to 105.8° F.); a critical fall of temperature, sometimes with perspiration and enlargement of spleen. All the cases were typical and contagious; when one person in a family was attacked by the disease all the rest got it, old or young; or, as it happened in the Military Hospital, very soon after a single patient had been brought in, all the others in that ward became infected. The culture in the Bacteriological Laboratory of Kharkoff University proved the infectious germ to be staphylococcus or streptococcus pyogenes. (Report of G. N. Scott, corresponding editor, Moscow, Russia.)

Acute Follicular Tonsillitis.—Boislinière ⁶⁵_{Feb.} says that in upward of one hundred cases of acute follicular tonsillitis the following formula has been used:—

R Sodii benzoat, 3 1 to 4 (4. to 15.5 grammes).

Glycerini,

Elix. calisayæ, āā f 5 1 (31. grammes).

M. Sig. : One teaspoonful every one or two hours.

In the analysis of the last seventy-five cases he finds that: 1. By the use of benzoate of sodium the disease is cured in from twelve to thirty-six hours,—a great gain in time, as the average duration of the disease has been heretofore from two to five days. The average duration for the seventy-five cases was twenty hours. In private practice, when the cases could be watched more carefully, the white, cheesy points have been frequently seen to disappear in from eight to ten hours. 2. The benzoate of sodium undoubtedly controls the febrile elements in the disease. 3. It may be given with impunity, even to children; he has never been able to discover any bad or even disagreeable effects from its action. 4. It is a valuable addition to the remedies used in throat affections, especially in an acute inflammatory condition of the tonsils, when applications only aggravate and gargles increase the trouble.

Gouty Sore Throat.—Harrison Allen ^{June 16}₉ describes a variety of sore throat which, while independent of metastasis, is found in gouty subjects, and which yields only to remedies for gout. In a disease so protean as gout no one group of symptoms is to be expected. The subjects of the disease, however, have been in most instances middle-aged, and a distinct heredity has generally been traced. Pain may be confined to the throat, or be referred to it from a catarrh of the nasal passages. It is not apt to develop during an acute attack, but to occur in those who are prone to neuralgic forms of irregular gout, especially in the viscera—or in persons of gouty habit who are careless in their diet. Thus, dyspepsia and constipation are of frequent occurrence, and the tongue is often persistently furred. It does not follow, of course, that a sore throat occurring in a fatty subject is itself necessarily of a gouty nature.

The only ailment with which gouty sore throat may be confounded is the irritable throat of lithæmia. The latter may occur at any time of life, it is often dependent upon the diet, and, in young persons who are lithæmic, the pharynx presents a definite appearance, the mucous membrane being of a uniform red color, the secretions abundant, and the tonsils tumid. The general health is good, often robust. In older patients the symptoms are less constant. The tonsils are often small and concealed, and the parts bathed in secretion. Pain usually is not severe, and is referred to the muscles at the side. In true lithæmia the gouty history is absent.

Perhaps the best guides to a gouty condition are furnished by the permanent teeth, which are often found to be large, the antero-posterior diameters being especially exaggerated, the enamel thick and of a yellowish color. These peculiarities are confined to the incisors, canines, and bicuspid. The crowns are often marked by transverse lines, and the bases of the lingual and palatal surface are apt to be gibbous, while there is a tendency for the gums to recede from the necks of the teeth.

In the local treatment of gouty sore throat, all agents must be soothing in character. Operative procedures are not well borne, and if they are demanded they must follow the use of general remedies. The article closes with the history of five interesting illustrative cases.

Chassaignac^{Oct.}₁₂ suggests that there is a variety of acute tonsil-

litis in which malaria plays a prominent causative rôle, since in them there is a periodic exacerbation after painful symptoms, and since, also, they are not benefited by the usual methods of treatment, but yield readily to the alkaloids of cinchona.

The observation is an interesting one, and, although not absolutely new, is worthy of further consideration.

Reflex Phenomena.—Ruault²⁸⁶_{Apr.} has reported some reflex neuropathic phenomena of tonsillar origin, and states that if a galvanocautery bulb, the size of a pea, be applied to the centre of the tonsil, an intense pain is often provoked in the corresponding ear. If it be carried toward the inferior extremity other reflexes are determined, such as spasmodic cough, vomiting, and gastric pains. Chronic inflammation of the tonsils seems in some to produce these phenomena, and one finds in such persons intermittent otalgia, buzzing in the ears, attacks of coughing, bronchial asthma, and vomiting. These different symptoms may disappear after destruction of the tonsils, leaving no doubt that tonsillar hypertrophy may be the cause of them.

M. Ouspensky wrote on the influence of hypertrophied tonsils upon children,⁵³⁰_{No. 2} after examining fifty-two boys with enlarged tonsils, aged from four to ten years, as to weight, height, chest measurement, sight, and hearing. Hereditary tendencies and mental capacities were also noted. Defect of hearing showed the largest percentage—37 per cent. Progress in learning, 27 per cent. were deficient. The author considers tonsillar hypertrophy a hereditary disease, and therefore advises general as well as local treatment. (Report of Dr. G. N. Scott, corresponding editor, Moscow, Russia.)

Sudden Disappearance of Hypertrophied Tonsils.—Corminas⁴⁵⁶_{May 10} reports a case in a girl of nine years, in whom, following an attack of scarlatina accompanied with severe angina, an enormous hypertrophy of the tonsils of five years' duration suddenly and absolutely disappeared.

Simonena, in the same journal, reports a similar case in which a like result followed a severe attack of diphtheria.

Hæmorrhage after Tonsillotomy.—Cases of severe hæmorrhage following tonsillotomy are reported by Fuller,⁵_{Apr.} Clarke,¹_{July 7} Blair,²¹⁶_{Feb.} and Delavan.¹¹⁵⁸ In Clarke's case the tonsils had been partially removed, and the bleeding was stopped by ligation of the

stump *en masse*. The cases reported above include five, all adult males. In an article on the surgical pathology, ætiology, and treatment of hæmorrhage after tonsillotomy, Delavan¹¹⁵⁸_{Vol. 10} advances the following statements:—

Tonsillar hæmorrhage is of four varieties: (1) arterial, from the division of one or two large arterial branches; (2) arterial, from the division of a large number of arterial twigs; (3) venous, from division of the small plexus of veins which lies below and outside of the tonsil; (4) capillary, or general, from the presence of the hæmorrhagic diathesis.

The first two varieties seem to be the most common. With them age plays an important part. Of eleven cases, known to the writer, the youngest was twenty-one, the oldest thirty-four; the average age was twenty-seven. All were males. In all cases examined microscopically there was marked hyperplasia of the fibrous stroma of the gland, with dilatation of the arterial branches, which explains their failure to contract. The blood supply of the tonsil, excepting for the ascending pharyngeal artery, is derived almost exclusively from the external carotid. The internal carotid is too remote to be injured itself, while in the cervical portion it gives off no branches. There is not an authentic case on record in which tonsillotomy, performed for simple hypertrophy and by modern means, has proved fatal. It must be most unusual, therefore, for one of the larger trunks to be cut. Study of the history of the cases of severe arterial hæmorrhage shows (1) that in most instances ligation of the common carotid has failed; (2) that bleeding has continued, in spite of all other efforts to stop it, until the patient has fainted, when it has ceased, and has not, as a rule, recurred. This is because (1) ligation of the common carotid does not stop the collateral circulation through circle of Willis, and (2) because arterial tension and cerebral hyperæmia being relieved, the chief cause of the bleeding is removed.

Treatment.—Ligation, except of the external carotid, is practically useless. In variety (1), torsion or cauterization of the bleeding vessel; in (2), if other means have failed, opium, constriction of the extremities, the upright position and the encouragement of syncope, and, if possible, ligation of the base of the tonsil; in (3), pressure and cold; in (4), pressure, cold, and styptics.

Saint-Germain⁴⁶² believes that ignipuncture of the hypertro-

phied tonsils of children, the thermocautery being thrust into each crypt to the depth of a centimetre, is destined to replace with advantage tonsillotomy, since the accidents of tonsillotomy from hæmorrhage or the invasion of the wound by diphtheria may prove fatal. [The editor of this department cannot agree with this view, for three reasons: 1. The process is far more difficult and painful than tonsillotomy. 2. There is not an authentic fatal case of hæmorrhage after tonsillotomy on record. 3. While he has seen and performed hundreds of tonsillotomies without having known diphtheria to occur in the wound in a single instance, he has known of four cases in which the disease immediately followed the use of the galvanocautery.]

Gangrenous Tonsillitis.—Cragin¹_{Sept.1} reports a case of gangrenous tonsillitis in a man of forty-five, in which death was caused by a sudden and copious hæmorrhage from the pharynx. At the autopsy a large ulcerated area was found in the pharynx, occupying the site of the right tonsil and extending for some distance on the post-pharyngeal wall. To this was attached a large slough. In the part of this ulcerated surface formerly occupied by the right tonsil were visible the open mouths of two small vessels, which were evidently the source of the hæmorrhage.

Vergely,¹⁶⁸_{June 1} in his paper on perforation of the internal carotid in a case of phlegmonous tonsillitis, reports an interesting instance of this accident and quotes a number of similar cases described by other authors. Although unusual, it has still happened so many times that it may be well to bear in mind the possibility of its occurrence, and, if hæmorrhage should follow the opening of such a tonsil with the bistoury, blame of the result, should the case prove fatal, ought not to be attributed to the operator. Vergely suggests that the bleeding may be stopped by ligation of the common carotid.

Abscess.—Way⁹_{Mar.17} reports the case of a man, aged twenty-four, in whom death from suffocation was caused by the sudden rupture of a tonsillar abscess during sleep.

Noquet¹³⁶_{July} relates an interesting case of chronic abscess of the stump of an ablated tonsil, in which, from a small fistula communicating with the exterior pus had exuded daily for a period of six months after the ablation of the gland. The patient, a married woman of twenty, had been the subject of tonsillar hypertrophy

from her infancy. The stump was notably inflamed and hypertrophied. An incision made through the fistula released about a teaspoonful of pus, and after several cauterizations a cure was effected.

W. Pasteur⁶_{July 14} reports the case of a child of three months old in whom a tumor of the neck was found to be in immediate relation with the tonsil. Fluctuation was distinct, both within the pharynx and without. External incision was followed by evacuation of the abscess and immediate relief. Five months later the same condition recurred and was relieved as before. A probe inserted into the abscess-cavity impinged against the finger on the tonsil, with only mucous membrane between. In the neck the cavity lay in front of the great vessels.

Tumors.—Richardson⁹⁹_{Feb. 23} reports a case of round-celled sarcoma of the left tonsil successfully removed from a female patient by an external incision, three inches in length, along the anterior border of the sternomastoid muscle. Eight months later the woman was alive and no recurrence of the growth was visible.

The history of a case of primary sarcoma of the tonsil by MacCoy,¹¹⁵⁸_{Vol. 10} is interesting as being one of the most carefully observed and thoroughly reported cases on record.

Lannois²¹¹_{Nov. 4} describes an interesting case of pedunculated fibrous polyp of the tonsil, of large size and almost filling the lower pharynx.

Villar⁷_{Mar. 2} found in the Ecole Pratique a patient suffering from a very large tumor of the pericardium, invading the heart and principally the right ventricle. Histological examination showed it to be lymphadenoma. This patient had been treated for a tonsillar lesion recognized as malignant, after having been put under antisymphilitic treatment. Besides this, the glands of the neck had developed enormously, and, asphyxia threatening, tracheotomy became necessary. This prolonged life for three months. On auscultation of the heart it was thought that there was insufficiency.

SOFT PALATE.

Chorea of the Soft Palate.—Schadlc⁶¹_{Oct. 29} gives an excellent report of a rare case of chorea of the soft palate, caused by the hypertrophy and hyperæsthesia of the mucous membrane covering both inferior turbinated bodies, which cannot fail of being read

with interest. The patient, a highly neurotic girl of seventeen, received at the age of ten years a succession of severe nervous shocks from fright, following which there was noticed a peculiar clicking sound in the throat. This phenomenon continued up to the time she was observed by Dr. Schadle. As to its mechanism, in looking into the patient's mouth it appeared that the velum palati was rapidly raised and lowered, without being made entirely tense. At the moment of relaxation of the levatores a singular ticking sound was produced which in a quiet place could be heard at a distance of twenty feet. This sound corresponded with a complete contraction and relaxation of the levatores palati, and by actual count occurred one hundred and twenty times a minute, with little variation in frequency at any time. The tone of the clicking was changed by closing the nose and by otherwise altering the other conditions of the mouth and nose as to the volume of air contained, but neither that nor any other manipulation caused the cessation of the noise or its cause. Rhinoscopic examination revealed hypertrophy of the adenoid tissue at the vault of the pharynx and marked hypertrophy of the posterior extremities of the inferior turbinated bodies. The nasal mucous membrane was markedly hyperæsthetic. Removal of the enlarged pharyngeal tonsil was followed by temporary relief, but the choreiform movements returned suddenly, under an attack of nervous excitement. It was observed that cocainization of the nasal passages generally produced relief for the space of half an hour. With the intention of reducing the hypertrophy and hyperæsthesia of the enlarged inferior turbinated bodies the galvanocautery was thoroughly applied to them, when the trouble at once ceased, and, although the patient was subsequently subjected to the most severe nervous shocks, it did not recur.

Adhesion of the Soft Palate to the Wall of the Pharynx.—Griffin⁵⁹_{Jan. 14} and Duncan⁵⁹_{Jan.} report interesting cases of successful operation for the relief of adhesion of the velum to the posterior wall of the pharynx. The first dissected an opening into the upper pharynx, by the aid of a sound passed through the nose, which was kept open by the habitual use of a dilator by the patient himself. The latter had the blades of a pair of blunt-pointed scissors bent at a right angle, their points slightly curved forward to avoid the roof of the pharynx, and their outer edges converted into cutting blades.

The parts being cocaineized, the scissors were introduced, and by firmly opening them an incision made of over an inch wide. This was kept from reuniting by using the scissors, their blades protected with cotton, as dilators, and occasionally severing the commencing adhesions at the angles of the wound with the naked instrument.

INTUBATION OF THE LARYNX.

By E. FLETCHER INGALS, A.M., M.D.,

CHICAGO.

INTUBATION IN MEMBRANOUS LARYNGITIS.

O'DWYER's method for the relief of membranous laryngitis has steadily gained in favor during the past year, and now may be said to be an established operation, the value of which is generally accepted, at least by the profession of this country. In Europe physicians have been slow to appreciate its value, so that its status there is at present about the same as it was in this country two years ago. In other words, it is still on trial and receiving the same criticisms which have here long since spent their force. The tardiness of our European confrères in adopting this operation is doubtless due partly to the unavoidable delay in obtaining instruments, partly to lack of information about it by the majority of the profession abroad, and partly, as suggested by Ernest Graser,⁹⁹_{Oct. 25} of Erlangen, with reference to Germany, "because of a certain reserve toward American inventions."

During the past year many papers upon this subject have been published in the current medical literature. The majority of these consist of a *résumé* of the literature of the subject and reports of cases, and are mainly of statistical interest. Three important papers have appeared during the year: one by George W. Gay, of Boston, on "The Comparative Merits of Tracheotomy and Intubation in the Treatment of Croup;" one by Joseph O'Dwyer, on "Intubation in Chronic Stenosis of the Larynx;" and a short paper by W. E. Casselberry, of Chicago, on "A New Method of Feeding in Cases of Intubation."

George W. Gay,⁹⁹_{Oct. 11} says: "The novelty and boldness of the method are so striking that many surgeons whose experience has made them familiar with the old operation hesitated, and very properly hesitated, to accept the new one until careful and repeated trials had demonstrated its value to a reasonable extent. That stage in its career has been reached where there can be no doubt

that it relieves dyspnoea, that it saves life, that it is a reasonably safe operation to do, and that in the majority of instances it is more easily performed than tracheotomy. . . . The facts available at present go to show that nearly, if not quite, as many patients recover after intubation as after tracheotomy."

The instruments now in use by the majority of surgeons are the same as those recommended by O'Dwyer more than two years ago. Various modifications have been made with a view to overcoming supposed objections, but as a rule experimenters have finally learned that O'Dwyer's conclusions were correct. At first sight it would appear that the calibre of the tube is too small to allow of easy respiration, but O'Dwyer's experiments convinced him that the sizes which he adopted were best, for the reasons that they allowed abundant space for respiration and, at the same time, enabled the patient to expectorate much more readily than with tubes of larger calibre. O'Dwyer¹⁰⁴_{June 23} says: "After an experience with tubes of various sizes in over two hundred cases of croup, besides other forms of stenosis in children, I am fully convinced that as at present constructed they afford ample room for carrying on the respiratory function in the most perfect manner. When the struggle for breath has continued long enough to produce extreme exhaustion, together with atelectasis and congestion of the lungs, perfect relief does not occur. The same is true after a partial asphyxiation induced by prolonged or repeated attempts to insert the tube. Such cases never rally although air may enter the lungs in the freest possible manner. If any dyspnoea whatever remain for any considerable time after intubation, or if the respiration be much above the normal in frequency, it indicates the presence of some complication or extension of the disease below the tube. The fact that several times on removing the tube from the larynx I have found its calibre considerably reduced by firmly adherent secretions, when there had been no dyspnoea to indicate it, is good evidence that there is more room than is actually required for the free entrance and exit of air." He further claims that the power to expectorate is diminished in exact proportion to the increase of the calibre of the tube beyond the size necessary for easy respiration. O'Dwyer's first tubes were small and made to rest upon the vocal cords, with the idea of permitting the approximation of the ventricular bands above them. He found these unsatisfactory, and

such, we think, has been the experience of most of those who have subsequently gone through similar experiments with the same object in view or in the hope of rendering deglutition easier.

Waxham, of Chicago, ¹⁴⁹_{Apr.} presented to the Chicago Medical Society a new tube that he had invented, which he hoped would allow the patient more easily to swallow fluids. This tube was similar in size and shape to O'Dwyer's tubes, but was fitted at the lower portion of the head with a small metallic lid or epiglottis, hinged to the tube and held erect, except during deglutition, by a fine gold spring. He hoped that on attempts at swallowing this lid would be forced down over the opening in the tube and thus prevent the entrance of fluids into the trachea. From his report it appeared that this device in some cases rendered deglutition easier, while in others it had little if any effect. In the discussion which followed, F. O. Stockton objected to the new device on the ground that the hinge exposed a roughened surface on the inner side of the tube that might afford a lodgment to membrane or septic material. E. Fletcher Ingals thought that the amount of mucus or false membrane or septic material that might catch about the little hinge would be a trifling matter when the large amount already in the throat was considered. Under certain circumstances, as, for example, when the tube was in perfect position and the epiglottis acting naturally, this device seemed to accomplish the end for which it was intended, but when the tube became slightly twisted to one side, or when the epiglottis was much swollen, or altered in form from deposition of false membrane, it frequently happened that the metallic lid would not close the opening better than the epiglottis itself. Fortunately, the subsequent discovery of an improved method of feeding has rendered this ingenious device unnecessary.

C. Stoerck ²³⁶_{Apr. 21} recommends a short tube about four centimetres in length. When the tube is in position the rim at its upper end rests upon the vocal cords and extends into the ventricles of Morgagni, as it did with the first tubes used by O'Dwyer. Stoerck's tube was inserted with a peculiarly constructed forceps which held the tube during its introduction, and on removal withdrew a perforated plug which extended to the lower end of the laryngeal tube. This plug was perforated in order to admit the passage of air during the operation. In this device we can see no advantage

over the tubes which were long ago discarded by O'Dwyer, except the perforated plug, which might in extreme cases be of some value.

James Ridge, ²_{Oct.13} of London, describes a method of naso-laryngeal intubation which he had tried in four cases. In all cases the dyspnœa had been relieved for the time being, but the patients had finally succumbed to the disease. His method consists of passing a gum-elastic, silk catheter, the closed end of which has been cut off, through the nostril into the laryngo-pharynx, and thence guiding it, by the finger within the mouth, into the larynx. He recommends that a similar catheter be passed through the opposite nostril into the œsophagus for the purpose of feeding.

J. W. Pinkham, of Montclair, N. J., ¹_{Mar.17} believes that a collection of secretions above the tube often greatly interferes with the respiration. He has devised an aspirator for removing this, but, as the instrument has not been tried, a description of it is unnecessary.

One of the obstacles to this operation with the inexperienced is the difficulty of determining by the sense of touch the exact position of the glottis. In young children the epiglottis is so flaccid that it can scarcely be felt, and, therefore, the tube has been sometimes crowded into the tissues outside the larynx, causing considerable damage. To avoid this obstacle in introducing the tube the forefinger of the left hand is passed down behind the arytenoid cartilages. These are easily felt, conveying a sensation to the examining finger not unlike that produced by touching the end of the index finger of the opposite hand. The tube is then guided down on the palmar surface of the finger until it reaches the larynx, when the end is carried slightly forward, and may be easily pressed into the glottis. Care should always be taken not to use great force, for it is never necessary. Only tubes should be used of a size which can be passed readily. If the tube is so large that considerable force is required to introduce it, there is danger, in case it becomes clogged by false membrane, that it cannot be coughed out and thus may cause suffocation. In removal, special care should be taken that the blades of the extractor are not opened until they are slipped into the tube, otherwise injury to the larynx may occur.

Among other indications for this operation, d'Heilly ⁴³³_{May 15}

specially recommends it in the croup that follows measles, which, he says, is never successfully treated by tracheotomy.

The operation, notwithstanding the criticisms of German surgeons, seems specially adapted to those cases where neither skilled assistants nor good nursing can be secured. In very young children, in whom tracheotomy is not well borne, intubation offers the most valuable relief. I consider the operation well suited to nearly all cases of membranous laryngitis, whether in children or adults, except those in which there is a probability that the membrane has extended into the trachea. In such cases the danger of crowding the membrane downward and producing suffocation must not be overlooked; and it must be remembered, further, that it is not practicable to remove the membrane thoroughly except after tracheotomy. Fortunately, the accident of pushing the membrane before the tube does not often occur, but when it does it demands prompt action to save the patient. In such cases if the tube is immediately removed the child will sometimes cough up the loosened membrane, but if it does not the trachea should be opened at once. Dr. O'Dwyer⁹_{June 23} says that out of two hundred cases in only two has he crowded the membrane down sufficiently to produce asphyxiation, and that in both of these it was immediately coughed out on removal of the tube. I cannot recommend the attempt to remove this membrane by forceps, as suggested by Waxham, except as a temporary expedient. I have myself so crowded down the membrane in one case as to greatly increase the difficulty of respiration, and even on removal of the tube the membrane was not expelled; I then did tracheotomy, and removed a large amount of membrane from the lower portion of the trachea which could never have been extracted through the mouth.

In membranous laryngitis the tube is generally allowed to remain in the larynx from three to five days. In many cases, at the end of this time, the inflammation and swelling will have so far subsided that the tube will be coughed out, when it need not be reintroduced; in others it must be replaced, to be worn for one or two days longer. However, the tube may be worn for much longer periods without bad results. Ulcerations have sometimes occurred, especially during epidemics of measles, but this is not an accident to be anticipated in ordinary cases.

A large number of the deaths following intubation of the larynx have been found to result from pneumonia, supposed to be the result of the entrance of food into the air-passages during deglutition, and yet in none of the autopsies has any trace of food been found in either the trachea or bronchial tubes. Although the majority of the profession think differently, it may ultimately be found that O'Dwyer¹¹_{Apr.} was correct when he said: "A tube in the larynx, therefore, is a factor in the causation of pneumonia only in so far as it impairs nature's method of removing secretions from the bronchi by keeping the glottis open and thus preventing that condensation of air which is essential to give full effect to the act of coughing."

Although the frequent use of tubes with very small heads, designed to rest upon the true vocal cords, would seem to demonstrate that there is but little danger of the laryngeal tube passing into the trachea, yet a study of the literature of this subject and a personal knowledge of several cases not reported leads me to believe that this danger is greatly underestimated by the profession. Several fatal cases have been reported in which this accident has occurred, and it is doubtless true that many more have never been published.

One case has been reported by W. C. Deming⁵⁹_{Feb. 18} in which the laryngeal tube became occluded by coagulated milk during the act of vomiting and would have caused suffocation had not the physician been present and extracted the tube in time to save the patient by artificial respiration. Deming suggests that the tube was probably not coughed out because stoppage took place at the moment of extreme expiration following vomiting. Tubes have occasionally become obstructed by drying of the secretions.

There is no evidence that the tube has ever produced permanent impairment of the voice or of the power of deglutition.

At the Seventeenth Congress of the German Society of Surgery, held in Berlin, April, 1888, Professor Thiersch,¹¹³_{May 13} of Leipzig, reported thirty-two cases of diphtheritic croup which he had treated by intubation with O'Dwyer's method, in fourteen of which he had subsequently done tracheotomy. He is not favorably impressed with intubation, and it is reported that he has abandoned the operation. But this account does not seem to justify the statement. Although his results were poor, the fact

that fourteen of the cases were subsequently tracheotomized without relief seems to confirm his statement that the want of success was probably due to the character of the disease. Dr. A. B. Strong, of Chicago, after thirty-one intubations with only one recovery, became discouraged and abandoned the operation for tracheotomy, but since the discovery of a satisfactory method of feeding he has determined to try it again, and we believe this will be the case with other physicians here and abroad when they learn that the patient may be given unlimited quantities of fluid or other nourishment without danger.

Among the objections to the operation mentioned by Thiersch are: The difficulty in deglutition, the danger of pneumonia by aspiration ("schluck pneumonie"), ulcerations of the trachea which open the way to general infection, and the danger of coughing out the tube, necessitating constant watching of the child. Most of these objections have already been urged against this operation, but the first seems to have been overcome by improved methods of feeding. The second would appear, from frequent autopsies, as purely theoretical. The third is very slight except in those cases associated with measles, where considerable ulceration has sometimes taken place. It must, however, be remembered that this objection does not apply with more force to intubation than to tracheotomy, and that in these peculiar cases tracheotomy is nearly, if not always, of no avail. With reference to the last objection, it has not been the experience of surgeons in this country that such patients need constant watching. While tubes are occasionally expelled during fits of coughing, it is the rule that no immediate danger of suffocation will follow for several hours, therefore time is allowed to summon the surgeon. The many advantages of this operation in the majority of cases of diphtheritic laryngitis have been frequently stated. However, we must not forget that the operation is difficult and sometimes even dangerous; in rare instances it will not relieve the dyspnoea, in others the tube may be repeatedly coughed out, and in still others it may slowly or suddenly become occluded so as to produce suffocation. Undoubtedly many of the poor results have been due to the imperfect after-treatment. Physicians should not forget that the office of the tube is merely to allow the entrance of air, and proper medicinal treatment should be still continued to prevent extension of

the disease. Upon this point I am in full accord with Dr. William Pepper, ^{9 June 23} in the belief that mercurial treatment is of prime importance to prevent extension of the false membrane. Jacobi, J. Solis-Cohen, Daly, and others have also strongly advocated this treatment. In desperate cases much may be done in the after-treatment by the judicious use of stimulants, heart tonics, expectorants, and remedies calculated to stimulate the excretions without weakening the patient.

The greatest difficulty which has been experienced with intubation is found in feeding. Various devices have been recommended by different operators, some of whom have relied upon nutritive enemata, others upon the introduction of food through a stomach-tube, and still others have been in favor of withholding liquids entirely. M. d'Heilly, ^{100 May 3} believes that children should be fed with a stomach-tube, passed into the œsophagus through the nose, from the very first, while Waxham ¹⁰² recommends that the child be fed on semi-solids only, cracked ice and ice-cream being given to quench the thirst; stimulants to be given only by enema. Since early after the introduction of this operation most surgeons have adopted one or the other of these methods, but some have removed the tube at frequent intervals in order to administer nourishment.

By far the most important paper upon intubation which has appeared during the past year relates to feeding the patient while the tube is being worn. This was presented by Casselberry, ^{231 Oct.} of Chicago, to the Chicago Medical Society on the 3d of September, 1888, and is entitled "A New Method of Feeding in Cases of Intubation of the Larynx, by Position, Head Downward on an Inclined Plane." The method was suggested by Dr. Frank Cary, of Chicago, in June, 1888, and was immediately tried by Dr. Casselberry with most gratifying results. Since that time it has been tried by several other physicians with results equally satisfactory. It would seem that we have at last found a method of obviating the difficulties of administering liquids to patients who have undergone this operation. Casselberry says: "Regarding the exact position, the angle has varied in different cases; but from forty-five degrees to ninety degrees seems necessary to obtain the best results. The child is held on its back in the arms of the nurse, the feet elevated, and the head left to hang over the arm, then it may take

the mouth of the feeding-bottle, suck through a tube from a glass, or feed from a spoon. The only difficulty is encountered when the child is again placed in the upright position, which posture it must not be permitted to regain until it has been made to swallow three or four times after the vessel of liquid has been taken from its mouth, in order to swallow all the fluid which has gravitated into the pharynx and naso-pharynx. . . . There is no danger of the tube slipping out unless one too small has been used."

In practice it has since been found, as would naturally be expected, that some patients will swallow quite as well in the inclined position when lying on the abdomen, and some who will not swallow when lying on the back have no difficulty in the latter position.

Records have now been obtained of nearly two thousand cases of intubation for membranous laryngitis. An analysis of these shows that the operation is peculiarly advantageous in very young children. It has also been specially recommended for adults in whom tracheotomy for this disease is not usually successful. The results thus far show nearly the same though somewhat better percentage of recoveries as that given by me in a report of five hundred and fourteen cases to the American Laryngological Association in New York, in May, 1887. This report showed that 26.07 per cent. of cases had recovered. In October of the same year Dr. O'Dwyer⁵⁹ reported fifty cases with twelve recoveries, and in January, 1888, an additional fifty with fifteen recoveries, making a total of one hundred cases with twenty-seven recoveries, or 27 per cent. In May, 1888, Dr. Waxham, in a paper read in the section on Diseases of Children, at the American Medical Association,⁶¹ gave an analysis of one thousand and seventy-two cases, which he had collected from various sources, with two hundred and eighty-seven recoveries, or 26.77 per cent.

The latest records from Dr. O'Dwyer's personal cases show two hundred and fifteen cases, sixty-five of which were experimental, with only nine recoveries. Excluding these, there remain one hundred and fifty cases with forty-one recoveries, or 27.33 per cent.

In a personal letter to the editor of the ANNUAL, Dr. Waxham, of Chicago, reports one hundred and sixty-nine cases of

intubation for diphtheritic croup, with forty-nine recoveries, or 29 per cent. Just as this is going to press Dr. Waxham reports one hundred and eighty cases in all, with recoveries of over 31 per cent. Thus it will be seen that the results of the operation during the past year have not disappointed its advocates. This brings us again to compare the results of intubation with those obtained by tracheotomy. In 1878 Agnew reported eleven thousand six hundred and ninety-six cases of tracheotomy, with $26\frac{1}{4}$ per cent. successes. Monti, of Vienna, published over twelve thousand cases, with $26\frac{8}{10}$ per cent. recoveries, and Lovet and Monroe, in 1887, recorded twenty-one thousand eight hundred and fifty-three operations, the recoveries from which amounted to 28 per cent. It will thus be seen that the recoveries after intubation are not materially different from those after tracheotomy. Both operations may be attended with much difficulty and occasionally with danger; both are liable to complications; both have their advantages, and to both objections may be urged. But from the comparatively limited number of cases of intubation already reported it seems fair to conclude that it is to be preferred in very young children and in those cases so situated that skilled assistants cannot be obtained for the operation, and where the tube must be left to take care of itself. I believe that in nearly all cases it would be preferable at first, but subsequently, if the membrane extended into the trachea, tracheotomy should be recommended. In all cases where the membrane has become loosened and is pushed downward by the laryngeal tube tracheotomy should be at once resorted to, unless the membrane is expelled by coughing. In the language of Gay ⁹⁹_{Oct.11}: "Each operation supplements and neither supplants the other. The old one should ever be held ready to come to the aid of its young and vigorous rival."

With the new impetus to this operation which has been given by the discovery of a satisfactory method of feeding, I believe that it will be soon adopted by very many surgeons, and at the end of another year I have hope that the larger statistics will prove even more favorable than at present.

INTUBATION IN CHRONIC STENOSIS OF THE LARYNX.

Among the important papers on this subject which have been published during the year is that by Joseph O'Dwyer ¹_{Mar.10} on "Intuba-

tion in Chronic Stenosis of the Larynx." In this paper Dr. O'Dwyer expresses the belief that this form of treatment appears the most rational and practical method yet devised for the dilatation of chronic stricture of the glottis, and he reports five cases treated by this method, three of them by himself. The first of these cases had been treated for a year and nine months, and he states that there is scarcely any doubt but that it will be necessary to continue the dilatation during the rest of her life. The second case wore the laryngeal tube for ten months, when it was removed, leaving a large cylindrical opening in place of the glottis, through which respiration was easily carried on. Three months later there had been no change in the appearance of the parts. In the third case the tube was worn at intervals of several days each for a period of about four months, and was then removed, the patient's condition having been greatly improved. In the fourth case, treated by J. J. Reid, the tube was worn at intervals for seven months. Six months after its final removal there had been no return of the dyspnœa. In the fifth case, treated by Dillon Brown, a tracheotomy tube had been worn for three months, and could not then be removed on account of difficulty in breathing; but after the laryngeal tube had been worn for only a week, the patient was discharged as cured, being free from dyspnœa and having a good voice. The tubes used in most of these cases were of a special pattern and size, devised by Dr. O'Dwyer for this special purpose.

Chiari³⁷_{July; Oct.} has reported the case of a boy of twelve who had formerly been tracheotomized on account of diphtheria. At the end of seven years symptoms of tracheal stenosis occurred, and Chiari found a stricture extending from the third ring of the trachea to two or three rings below, caused by cicatricial tissue. The case was cured by methodical dilatation with elastic catheters, and remained free from signs of stricture at the end of fifteen months.

In the treatment of chronic cases deglutition has generally been carried on easily after a few days, and in none of these has O'Dwyer observed the least evidence of pulmonary disturbance from the entrance of food, although the tubes have been worn for periods varying from two weeks to ten months.

The operation has not been sufficiently tried in these cases to warrant us in expressing a positive opinion as to its merits, but

from the results already attained we may fairly hope that it will ultimately be so perfected as to add another valuable means in the treatment of these most intractable cases.

DISEASES OF THE LARYNX, TRACHEA, AND ŒSOPHAGUS.

BY J. SOLIS COHEN, M.D.,
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ANATOMY AND PHYSIOLOGY OF THE LARYNX.

A very valuable contribution to the anatomy of the larynx has been made by our collaborator, C. M. Desvernine, of Havana. As is well known, it was believed up to 1874 that the vocal bands possessed no mucous glands, but were lubricated by mucus exuded from glands in the laryngeal sac. Coyne, in 1874, described a few glands. Desvernine finds that Coyne had failed to detect the full number. He has found them in the supraglottic and infraglottic portions of the mucous membrane covering the bands, but not in the true glottic portion. In the superior portion he finds, but not constantly, a glandular group, deeply seated, and more or less close to the fibres of the thyroarytenoid muscle toward their ventricular border, the excretory ducts being directed obliquely toward the glottic border, and terminating on the superior surface of the bands at a variable distance from the papillary free border. Sometimes they are found deeply seated between the fasciculi of the thyroarytenoid ligament or entirely subjacent to it. Their number does not exceed three or four. The subglottic region, in which Coyne described but two glands, was found by Desvernine richly supplied with glands, all imbedded in fibro-elastic structures, and with their excretory ducts directed obliquely upward and inward.

Anatomy of the Epiglottis.—Mayo Collier¹¹ finds that the anatomical descriptions of the epiglottis found in the text-books are incorrect in several points. His dissections show that the glossoepiglottic ligaments have no other connection with the tongue than by the continuity of mucous membrane. He denies also the existence of a true thyrohyoid membrane. All that he finds is a thin fascia lining the inferior aspect of the thyrohyoid muscle and covering a quantity of areolar tissue and fat. This

fascia he finds to be co-extensive with and intimately attached to the hyoid origin of the thyrohyoid muscle, a well-marked interval existing between the two portions on the opposite side.

Effects of Cold on the Tracheal Circulation.—W. T. Porter^{82 Oct. 6} demonstrated to the Mississippi Valley Medical Association the effect upon the tracheal circulation of cold applied to the abdomen. The demonstrations were made on four cats, whose tracheas were exposed, incised, and held apart. A hot flaxseed poultice on the abdomen of each cat had congested the tracheal mucous membrane. When the hot poultice was replaced with iced cloths the mucous membrane became pallid instantly. After a while the red color returned, and was followed by the bluish-red of venous congestion. The important lesson to be learned from this experiment is that cold applications continued too long produce venous congestion and blood stasis, the very conditions most favorable to the destructive changes intended to be resisted.

Deficient Œsophagus.—An instance of deficient œsophagus has been recorded by Charles Steele.^{6 Oct. 20} A babe, twenty-four hours old, became very livid and dyspnoëic on being given nourishment, and regurgitated the food. A sound encountered an impassable resistance at a distance of five inches. It was decided to open the stomach and explore the œsophagus from below, with the intention of perforating a membrane if the obstruction should prove to be membranous. The infant took chloroform well. The abdomen was opened in the middle line above the umbilicus; the stomach was then stitched to the skin and incised. A bougie was passed into the œsophagus from the mouth, and another was passed upward for a short distance from the stomach, but the two did not approach each other by an interval estimated at an inch and a half. Further attempts to reach the upper section of the œsophagus from below having failed, the wounds were closed. The infant slept awhile, and died twenty-four hours afterward. On examination, *post-mortem*, the œsophagus was found to terminate above and below in blind, rounded ends an inch and a half apart. There was no cord or connection between the two ends.

INFLAMMATORY DISEASES OF THE LARYNX.

Primary Infectious Phlegmon of the Larynx.—Dr. Ernest Germonig, of Trieste, reports^{8 Dec. 6} the case of a woman, thirty-seven

years of age, who took cold in washing the floors of a number of rooms. Hoarseness ensued with inability to swallow water for three days. Each attempt to swallow caused intense suffering, and produced painful contortions of the face.

The pharynx, heart, and lungs were normal. There were no glandular swellings. The temperature was 39° C. (102.2° F.). The epiglottis was enormously swollen and transformed into two tumors, from the centre of each of which a purulent mass protruded. Cocainization and an attempt to press out the pus produced such immediate relief that the patient could readily drink some water and milk. The next morning she complained of intense pain in the right shoulder. Pyæmic pleurisy and pericarditis soon followed. On the morning of the third day she died, consciousness remaining to the last. At the post-mortem examination thick green pus was found in the epiglottis and extended through the entire submucous tissue to the cartilage. There was no other change in the larynx save redness. Purulent exudation was found in the pleuræ and in the pericardium; and the liver, spleen, and kidneys were swollen. A bacterial examination was not made.

Hager⁴_{No. 12} reports a case of phlegmon of the larynx in association with phlegmonous sore throat, in which recovery ensued after more than thirty days' illness.

Laryngeal Rheumatism.—A. Larauza³⁵_{June 21} considers that the larynx, from its complex anatomical structure and its location between the pharynx and the bronchi, both of which are susceptible of inflammation, separately or simultaneously, during the course of an acute articular rheumatism, is not likely to be spared by the rheumatic diathesis. Although Chomel indicated that grave laryngopathies take origin in acute articular rheumatism, the first important observation in proof dates from the inaugural thesis of Desbrousses, in 1861, since which time, except a few isolated facts by Liebermann, Fauvel, Coupard, and Joal, nothing appeared in France on the subject up to the inaugural thesis of Archambault, chief of Fauvel's clinic, on the acute laryngeal manifestations of rheumatism, Paris, 1886.

Larauza has not discovered a single reported clinical example of rheumatism of the laryngeal muscles. He reports the case of a physician, aged twenty-seven, with aphonia of rheumatismal origin. Moure found general hyperæmia of the larynx, with

impairment in the action of the thyroarytenoid muscles, due to the inflammation of their envelope of mucous membrane. The case resisted treatment for three months, when, upon examination, the left vocal band was found, with concave margin, immovably fixed in the middle line. At this time it was decided to try sodium salicylate, and under its influence the dysphonia disappeared completely in five days, and the voice regained almost its normal timbre. There was not the slightest articular or muscular pain, and the intrinsic muscles of the larynx were the only ones affected by the rheumatism.

E. F. Ingals, of Chicago, ¹²¹_{Oct} believes that laryngeal rheumatism is often mistaken for neuralgia. He finds it to occur most frequently in men, and most commonly during spring and autumn. Nearly all subjects are of the rheumatic diathesis. Pains follow the same routine as to intermission, remission, and exacerbation; and they are benefited only by those remedies and surroundings which have proven most useful in rheumatism. Two cases are related in detail from a series of some thirty to forty.

Hæmorrhagic Laryngitis.—In a statistic review of the laryngological clinic of our esteemed corresponding editor, Professor Massei, of Naples, Cardone ⁵¹³_{Apr} relates an instance of acute hæmorrhagic laryngitis. Based on some observations from the same clinical sources, together with a record of all the cases hitherto published, La Placa ⁴⁶¹_{Oct} defines hæmorrhagic laryngitis as an acute catarrh of the larynx, accompanied by hæmorrhage of the inflamed mucous membrane, owing to certain peculiar conditions, local or general.

Michael Pleskoff ³⁴_{Dec. 1} relates an instance of hæmorrhage of the larynx in chronic laryngitis. A male teacher, forty-one years of age, had for many years had severe cough, with expectoration. For two weeks the expectoration had been bloody on several occasions. Laryngoscopy revealed in the main the ordinary diffuse redness of the vocal bands common to chronic laryngeal catarrh; but in the region of the left vocal process, near the ventricle, there was an elongated, submucous, circumscribed bloody patch, which covered half the breadth of the vocal band, and which was evidently due to rupture of a blood-vessel. The treatment instituted consisted solely in suppression of the voice, and gradual absorption of the effused blood took place with its disappearance in three weeks.

Œdema of the Larynx.—The varieties in causation of œdema of the larynx are well shown in the following notes:—

G. H. Darwin ²_{Jan.14} has reported a case of œdema of the larynx, the location of which was not defined, due to the action of raw spirit poured into a woman's mouth while she was in a state of syncope. The patient recovered.

E. J. Moure ¹¹⁵⁸_{Sept.18} of Bordeaux, has reported a case of acute œdema of the subglottic region and the lower pharynx in a diabetic subject. It disappeared in three days.

F. Taliaferro ²³¹_{Sept.} reports a case of œdema of the epiglottis, the result of a chill while the patient was on duty at a railway station. Tracheotomy was necessary. The patient recovered.

Laconique ³_{Nov.14} reports a case of ary-epiglottic œdema in a drunkard sixty years of age. Cricotracheotomy was performed. Recovery followed.

A. Bandler ⁸⁸_{v.13, No.19} reports three cases: (1) œdema of epiglottis as the first symptom of chronic nephritis; (2) acute œdema of right aryteno-epiglottic region, apparently due to traumatism from a piece of bread; (3) œdema of epiglottis and laryngeal vestibule in a case of variola, with scarification and recovery.

Erysipelas of the Larynx.—Closely allied to œdema of the larynx is the subject of erysipelas of the larynx, in which œdema is frequent. Indeed, some observers have not hesitated to assert that non-traumatic œdema is always the result of erysipelas. Acute phlegmon of the larynx, of which an instance has been noted on page 2, is likewise as frequently attributed to erysipelas.

An interesting though fatal case of erysipelas of the larynx, despite intubation and subsequent laryngotomy, has been described by T. D. Merrigan. ⁵⁹_{Oct.6}

Hypertrophic Laryngitis of the Vocal Bands.—In an article upon clinical investigations into the etiology of hypertrophic inflammation of the vocal bands, Hugo Zwillinger ⁸⁴_{Dec.1787} expresses the opinion that the laryngitis is sometimes an expression of a condition which is much more usual in the nose, and is known as rhinoscleroma, of which it sometimes forms part and which occasionally occurs primarily in the larynx.

Isaac Barton ⁶²_{Oct.1} mentions excessive cigarette smoking as a common cause of hypertrophic chondritis vocalis.

Our corresponding editor, Professor Massei, of Naples, calls

attention to the fact that in the topical treatment of hyperplastic laryngitis G. Masini⁴⁶¹_{Nos. 1, 2} insists on the great advantage of Labus' method of flaying the vocal bands. He is not satisfied, as Massei is, with the topical applications of lactic acid. In another note Masini⁵⁰⁵_{No. 56} summarizes what has been written on the subject of nodular hyperplastic chondritis, and concludes in favor of the same plan of treatment, namely, extirpation of the thickened tissues.

At the Congress of American Physicians in September, in the American Laryngological Association, Sajous, of Philadelphia, recommended the use of chromic acid in those obstinate cases of chronic laryngitis in which the vocal bands are the seat of greatest trouble. After thorough anæsthetization with a 25 per cent. solution of cocaine, the acid, fused by heat to the end of a covered probe, is applied to one of the bands while the patient in his effort to make a sound brings the bands in apposition and thus renders accidental cauterization of their edges impossible. An abrasion the size of a small pea is the result, and this spot, after healing, is distinctly whiter than the surrounding parts. The applications are to be renewed every few days; each band being treated alternately, until all the areas of superficial congestion have been destroyed. In a number of cases thus treated the results were very satisfactory.

Perichondritis.—It is generally believed that perichondritis and necrosis do not occur except as a result of some specific dyscrasia, such as typhosis, tuberculosis, syphilis, and carcinoma. An illustration of the contrary, from an example in one of the lower animals, is cited by Procter S. Hutchinson,²_{Sept. 22} who depicts the larynx of a boar pig that died with inflammatory symptoms resembling croup, and whose larynx showed acute necrotic perichondritis of the cricoid cartilage. In this instance, Mr. Hutchinson claims that the inflammation was most probably catarrhal in origin, and that the perichondritis and necrosis had taken place independently of any specific influence.

Perichondritis of the cricoid cartilage in a case of Bright's disease has been noted by R. J. Pye-Smith.²²_{Dec. 10} The patient, a mason forty-eight years of age, had suffered occasionally from bronchitis for ten years. He had been hoarse for six months and had had paroxysms of dyspnœa for three or four days. There was œdema of the right ary-epiglottic fold. Tracheotomy was

performed, and in a fortnight the tube was removed and the patient discharged; the swelling in the larynx having greatly subsided. He worked comfortably for three weeks, when he returned with dyspnœa, general dropsy, and albuminuria. Tracheotomy was performed at the site of the old operation and relieved the dyspnœa, but the general condition did not improve. Right-sided pleurisy supervened, then perichondritis, and the patient sank.

There was found *post-mortem* a necrotic cavity at the internal aspect of the cricoid cartilage in communication with three ulcers, a deep one between the right ary-epiglottic fold and the vocal band, and two smaller ones posteriorly just below the right vocal band.

Perichondritis from syphilitic process is not rare. Among rather unusual manifestations we may note necrosis of upper horn of thyroid cartilage with resultant cervical abscess, a specimen from a fatal case of which has been reported by Maylard.²¹³
Mar.

A somewhat similar fatal case has been reported by Nunn²_{May 19} under the caption: "Necrosis of the Greater Cornu of the Hyoid Bone and of Ossified Portions of the Thyroid Cartilage; Extrusion of Sequestra from an Abscess in the Anterior Triangle of the Neck, following Gummatous Ulceration of the Tongue and Perichondritis of Thyroid and Cricoid Cartilages; Profuse Hæmorrhages; Pneumonia; Phthisis."

TUBERCULOSIS OF LARYNX.

Many articles on tuberculosis of the larynx have appeared during the year. Few contain anything new. The co-existence of tuberculous with syphilitic ulceration of the larynx has been described by J. D. Arnold⁷⁷_{Feb.} and by A. Gouguenheim,³⁵_{July 26} the latter author presenting chiefly the points of diagnosis of the associated conditions, and in particular the rapid and progressive destruction of the epiglottis, and the presence of cicatrices.

Lactic Acid.—Treatment with lactic acid frictions, in some instances preceded by scraping the tissues, is gaining favor. The monograph of Theodor Heryng, of Warsaw,¹¹⁵⁹₁₈₈₇ has received numerous editorial commendations; and the practice which he has recommended has been indorsed by the results of numerous writers, among whom we may refer especially to Luc,¹⁷_{Feb. 16} Oltuszewski,⁶⁹_{Feb. 23} and to Keimer,⁶⁹_{Nov. 15} who report a number of successes under treatment by curetting and frictions with lactic acid. In one

instance four miliary tubercles were seen by Keimer on the epiglottis, as verified by microscopic examination of the fragments scraped. His principal internal treatment was with creasote. A very important point insisted upon by this writer was the avoidance of loud speaking.

Menthol.—Treatment with menthol in 10 per cent. to 20 per cent. solution in olive-oil is still more highly recommended than heretofore by Albert Rosenberg, ¹¹⁶_{July, Aug., Sept.} of Berlin, who presents a table of fifty-seven cases thus treated by him. He claims for menthol, which he has been using uninterruptedly since 1885, an advantage over lactic acid in its analgesic effects, which increase with its continued use. The pain it produces passes off much more quickly than that from lactic acid. The menthol is not caustic. His results have been indorsed by Bechag, ²⁶⁷_{Feb.} My own experience is

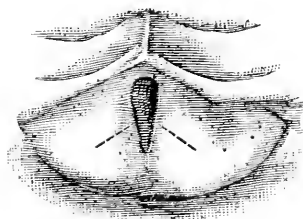


FIG. 1.—STRUCTURE OF THE SUPERIOR ORIFICE OF THE LARYNX.

(*American Journal of the Medical Sciences.*)

that menthol cannot be compared at all with lactic acid as an agent for actual riddance of tuberculous infiltrations, although it is an excellent calmative and subduer of collateral infiltration.

Spontaneous Cicatrization.—Cicatrization of tuberculous ulceration, although rare, sometimes takes place spontaneously. A unique instance of extensive ulceration with stricture of the larynx, in which the respiratory calibre was restored by cutting out large sections of tuberculous tissues, the cut surfaces of which likewise underwent spontaneous cicatrization, is reported by me. ⁵_{Dec.} The case was related and the specimens exhibited before the American Laryngological Association. The laryngoscopic appearances as shown in Fig. 1 revealed a cicatrized stump of epiglottis and an agglutinated diaphragmatic-looking stricture, which on examination proved to be of great thickness, and portions of which were sawed out with the knife in the direction of the dotted lines. The specimen removed *post-mortem*, shown in Fig. 2, showed that the cut surfaces had in great measure cicatrized.

In an article on "Laryngeal Phthisis," by W. D. Babcock, of Los Angeles, ⁴⁴_{Aug.} mention is made of one of my patients, then in Los Angeles, in whom laryngoscopic inspection shows a cicatricial

condition of the vocal bands formerly ulcerated, the patient still having trouble at the apices of both lungs.

Sulphurous Waters.—In a long article upon the mooted question of the utility of sulphurous waters in laryngeal tuberculosis, Henri Guinier,¹³⁶
Sept., Oct. comes to the conclusion that the water of the Raillère Spring, at Cauterets, exercises a very remarkable influence upon innervation and nutrition, which it regulates and stimulates in such a manner as to re-establish the general organic

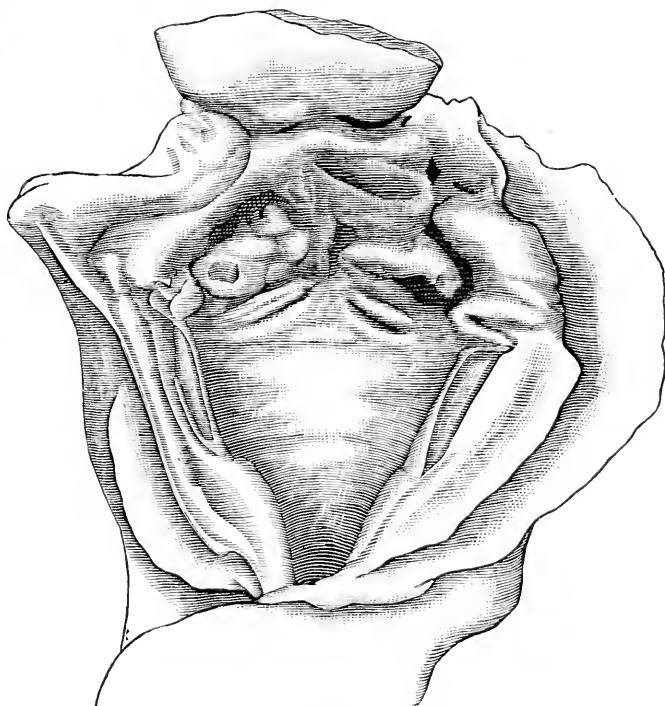


FIG. 2.—THE LARYNX EXPOSED POSTERIORLY.
(*American Journal of the Medical Sciences.*)

functions perverted or exhausted by the gravest dyscrasias, such as tuberculosis; that it exercises in addition an elective action of the most singular and favorable character on the tissues and the nutritive innervation of the respiratory organs, and in particular on the laryngo-bronchial mucous membrane and the mucous membrane of the pharynx and of the nasal passages. Employed as a beverage, in the bath, or topically upon the accessible mucous membrane of the laryngo-bronchial passages in spray, in gargles, and the like, whether utilized alone or in association with the

other sulphurous waters of Cauterets, the water of the Raillère Spring is capable of ameliorating and sometimes of curing undoubted laryngeal phthisis, even at an advanced period.

Tuberculous Tumors of the Larynx.—Pseudopolypous laryngeal phthisis has been studied by A. Gouguenheim and P. Tissier.³⁷ It occurs in certain classes of patients, usually young ones, at the earliest period of pulmonary tuberculosis, and without any other lesion of the laryngeal mucous membrane. The pseudopolypous infiltrations occur most often at the base of the epiglottis, then in the interarytenoid region and the subglottic portion of the larynx, but have been noted likewise in the vocal bands, ventricular bands, and in the ventricles. They are sometimes solitary, sometimes grouped in cauliflower masses, may vary from the size of pinheads to that of small nuts, and may be pale, rosy, or congested. Bacilli are found in them and stamp them as tuberculous.

A case of warty growth in association with presumptively tuberculous chronic laryngitis, and treated by tracheotomy and subsequent endolaryngeal removal of the growth, is described²_{Feb.4} by Hunter Mackenzie.

A case of primitive tuberculous tumor from the clinic of our corresponding editor, Professor Massei, of Naples, has been reported⁵¹³_{Apr.} by Cardone.

Bonome⁴²_{Nov.} reports an anatomico-microscopic study of the larynx of a patient dead of pulmonary tuberculosis. A prismatic-shaped neoplasm, without erosion, was found in the left ventricle. Microscopic examination revealed a connective-tissue growth with copious admixture of leucocytes, and with numerous tubercles in giant cells in its centre. Tubercle bacilli were found in the protoplasm of several giant cells.

Carl Dehio²¹_{No.16;} ¹³⁶_{Oct.} reports an instance of primitive tuberculous laryngeal neoplasm in a man, forty-one years of age, in good health, without any symptoms of tuberculosis or of syphilis. A gray bosselated tumor occupied nearly the whole surface of the left ventricular band, concealing the vocal band as far as the posterior vocal process, and was continuous without line of demarcation with the red and swollen mucous membrane of the ventricular band. Under the impression that the tumor was malign, it was extirpated by laryngotomy. Under microscopic examination it was found to be composed of miliary tubercles, with numerous

bacilli. The patient died seven weeks later under symptoms of pulmonary tuberculosis, but an autopsy was not permitted. The tumor had recurred several days after the operation.

The author concludes (1) that primitive tuberculous tumors of the larynx may exist a long time without undergoing calcification; (2) that their ablation is dangerous, because the germs of infection hitherto inclosed in the tumor penetrate the organism through the wound and produce secondary infection of the lungs; (3) that if removal is determined on, the electric cautery should be used in preference to the bistoury.

Additional instances of tuberculous tumors of the larynx have been reported by Hennig,⁴ Marty,³⁷ and others.

LUPUS.

Orwin,²_{Mar. 31} reports the case of a girl, aged twenty-one, who came to him in 1886 with lupus of the nose only, and who returned in 1888 with lupus of the gums, soft palate, pharynx, and larynx. He was of the opinion that the disease had spread by way of the lymphatic channels.

Lennox Browne,²²_{Apr. 18} has seen twelve cases of lupus of the throat, in all of which but one the disease in the throat and larynx has been secondary to that on the face. In five the larynx alone was affected, in four the larynx and soft palate conjointly, and in three the fauces alone. In seven there was lupus of the nose also, in all of which the laryngeal lupus was confined to the epiglottis. Browne has found lupus always to attack the palate from the anterior surface in contradistinction to tertiary syphilis, which makes the attack most frequent on the nasal surface. He opposes Orwin's views that lupus spreads from nose to palate by the lymphatic channels.

J. B. Marty has written a monograph¹¹⁶⁰ on lupus of the larynx based upon eighty-five observations, of which eight were personal and six unedited. In an analysis of this thesis³⁷_{Aug.} we find the conclusion that the disease is a form of laryngeal tuberculosis characterized by a lack of the infectious element of the bacillus; in other words, it is an attenuated tuberculosis. Treatment comprises topical attack by scarification or cauterization, the maintenance of good hygiene, and the internal administration of cod-liver oil and of arsenical preparations.

Scanes Spicer²_{Sept. 15} reported a case of lupus involving the upper respiratory tract, with small tumors (lupoid?) of the larynx. A female, eighteen years of age, had had slowly extending lupus of the face for eight years. The disease extended along the floor of the nose, and skipping pharynx, palate, tongue, and uvula, seemed to have attacked the larynx in the form of two symmetrical club-shaped tumors on the ventricular bands just behind their anterior attachments.

Luc, of Paris,²⁸⁶_{Sept. 15} describes in detail a rare instance of lupus of the larynx, pharynx, and nasal passages independently of cutaneous lesion. The patient was a gardener, twenty years of age, who had begun to have nasal and laryngeal obstructions about six years before; stridor and hoarseness having lately supervened. Lupus nodules were found on both surfaces of the septum narium, on the posterior wall of the œsophagus, in the rhinopharynx, on the vocal bands, and on the posterior wall of the trachea. Subsequently fresh ones appeared on the ventricular bands. Improvement took place under internal administration of iodine and potassium iodide in cod-liver oil. Luc distinguishes lupus clinically from tuberculosis by its commencement in a vegetating outgrowth, the preservation of the vegetant aspect up to the process of cicatrization, the absence of depressed ulcerations, the absence of yellow spots, the dryness of the surface, and the absence of pains.

While I am not familiar enough with lupus of the larynx and upper air-passages to speak with authority, I have seen enough of it to know that it does not always commence nor always progress in the manner described.

SYPHILIS OF THE LARYNX.

J. Garel³⁷_{June} recorded an interesting case of specific perichondritis of the left arytenoid cartilage, the symptoms of which simulated an acute œdema of the larynx, and which was complicated with a sessile fibromyxoma the size of a large pea, situated at the anterior commissure of the glottis.

Chas. Mauriac³⁶⁰_{Feb., Mar., June} has contributed a most valuable and quite exhaustive article, biographical and personal, on tertiary syphilis of the larynx. Many references are made to unusual manifestations. The chief feature is the attention given to a consideration

of the laryngoplegias of syphilis and to the means of discriminating them from similar neural lesions of different origin.

I read a rather elaborate paper on syphilis of the larynx, trachea, and bronchi before the Philadelphia County Medical Society, September 12,⁹_{Nov.3} in which was a general summary of the subject presented in its various clinical aspects, its pathology, symptomatology, etiology, diagnosis, prognosis, and treatment.

In a review of the laryngological clinic of our corresponding editor, Professor Massei, of Naples, Cardone⁵¹³_{Apr.} mentions a case of condyloma of the larynx, and several of gummata and of pharyngo-laryngeal stenosis.

STRICTURE AND STENOSIS OF THE LARYNX.

Greville Macdonald²_{Sept.15} reports a case of laryngeal stenosis cured by ablation of a vocal band. The patient was a man, thirty-five years of age, who had had syphilis in 1880-1, with unusually severe secondary manifestations. He had had left-sided hemiplegia in October, 1883, from which he had recovered after six weeks' treatment.

In August, 1887, the man came under Dr. Macdonald's care with almost complete aphonia and occasional attacks of dyspnœa. There was general and almost uniform and symmetric hypertrophy of the structures surrounding the glottis, and although the arytenoid cartilages moved freely, the thickened vocal bands were too wide to afford an aperture sufficient for respiration. Vocalization was almost impossible in phonation from the great pressure of the vocal bands upon each other. Alarming dyspnœa on August 30th rendered tracheotomy requisite the day following. September 20th Dr. Macdonald began the systematic destruction of the posterior portion of one of the vocal bands with the electric cautery, and subsequently removed the greater portion with sharp-cutting forceps until about four-fifths had been removed. The treatment extended until the following June 14, 1888, at which time the patient could breathe readily through the natural passages and speak in a loud and intelligible, though rough voice.

David Newman, of Glasgow,²_{Sept.15} reports two cases of complete laryngeal stenosis from suicidal wounds, treated successfully by dilatation with tents and the subsequent insertion of the chimney cannula with the phonal reed. Space for the tent was gained by

first passing a probe and dragging a silk thread through the stricture from below upward and out of the mouth, and then adding more and more threads, day by day. Dr. Newman²¹³ subsequently reported a case of syphilitic stenosis treated in the same manner.

A case of successful dilatation of a membranoid stenosis in the cricoid region was reported by Frank Donaldson,¹¹⁵⁸ of Baltimore, Sept. 18 of

Membranous Occlusion of the Larynx.—Occlusion of the larynx by a web of membrane between the vocal bands is usually remediable by intralaryngeal surgical procedure. An exceptional instance requires notice, in which unusually severe measures were necessary. Seifert and Hoffa⁴_{Mar. 5} detected a congenital web in a female, sixteen years of age, which was so tough that the point of a knife became broken off in an attempt to incise it intralaryngeally. It resisted division with an electric cautery. External access was then decided upon. After incision of the skin and detachment of an enlarged thyroid gland by dividing the fascia after Rose's method and then pushing the gland downward, a high tracheotomy was performed and a Trendelenburg cannula inserted. The cricothyroid membrane was divided horizontally. A probe-pointed knife was pushed up and behind the web, which was then divided from behind forward, and the thyroid cartilage divided in the middle line at the same time. On separating the wings of the cartilage, the occluding tissue was found to be membranous in its posterior portion only. Anteriorly it formed a thick curtain of tissue which passed obliquely forward and was adherent to the anterior wall of the larynx, about a finger's breadth below the vocal bands. This was resected so as to free the lower portion of the larynx, and thus restore the vocal bands nearly to their normal configuration. Cartilage, perichondrium, muscular tissue, and skin were secured in position with catgut sutures. An ordinary cannula was retained in the trachea until the fourth day. On the twelfth day cicatrization was complete. Two weeks later the anterior third of the vocal bands had become re-adherent. This adherence was overcome by systematic dilatation with Schroetter's bougies; but their use had become continuously necessary, although the voice had become good, as a constant disposition remained toward re-adhesion at the anterior commissure.

MORBID GROWTHS.

Among the many records at our disposal are selected those which illustrate the less frequent varieties, the less frequent situations, and the less usual treatment.

Papilloma.—Charles A. Todd, of St. Louis,⁶⁵_{Jan.} reports the intralaryngeal removal of an extensive papilloma of at least twenty-five years' standing, attempts at removal of which had been made in London in 1862. Hoarseness had existed for thirty-three years. The patient, a male, had for ten months been compelled to sleep in the sitting posture. The tumor sprang apparently from the anterior portion of the larynx and near the base of the epiglottis. Weight increased and health was restored after the operation.

Michael Braun, of Trieste,⁵⁷_{May 6} reports a papilloma occupying the left arytenoidal mucous membrane; a very unusual situation for papilloma, benign growths presenting anteriorly as a rule.

Massei⁴⁶¹_{July} reports a case of papillary growth in a woman, whose larynx was catheterized with Schroetter's tube during a spasm in order to gain time for tracheotomy at a moment of election, and thus avoid a precipitate operation in the consultation room.

Frank O. Stockton²⁹⁷_{Dec.} reports two instances of subglottic papilloma out of a number he has treated during the past two years; one large and smooth, one multiple and mulberry. Both were removed endolaryngeally, the former with forceps, the latter with snare and curette. The multiple papilloma proved recurrent, and several smaller growths have been removed at intervals of two or three months.

Julius Sommerbrodt⁴_{Oct. 15} reports an interesting case of multiple papilloma in which laryngofissure was necessary. A woman, forty-two years of age, had complained of hoarseness of twenty-eight years' duration, with dyspnoea of five years' standing. This was found to be due to multiple papilloma. Complete cure, with restoration of voice, was secured by evulsion after incising the larynx. The laryngoscopic appearances being such as to indicate that thorough medication was apparently impracticable by intralaryngeal procedure, tracheotomy was performed, the cricothyroid ligament divided, the trachea tamponed, the larynx divided upon a probe-pointed director, the papilloma removed with scissors and sharp spoons, and the points of attachment energetically cauterized with the electric cautery. The bleeding was not inconsiderable.

The tracheal cannula was removed on the fifth day and the patient discharged on the eleventh. Twenty-six months after operation the voice remained excellent and the general condition was entirely satisfactory.

J. B. Marty³⁷_{Nov.} reports an instance of hypertrophy of the ventricular band simulating a moderately large pedunculated polyp. Both ventricular bands were augmented in volume, the right band presenting an hypertrophy in the similitude of a pedunculated polyp (Fig. 3), very movable and partly concealing the glottis. This pseudopolyp was reddish and very hard, as shown by futile attempts to remove it with cutting forceps, which only scraped it but could not cut. It was therefore treated by electric cauterizations, under which it receded quite rapidly, so that the patient quitted treatment in a much ameliorated condition, which had con-

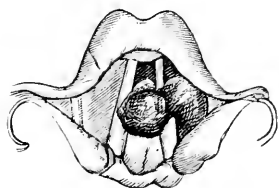


FIG. 3.—POLYPOID HYPERTROPHY OF VENTRICULAR BAND.

(*Annales des Maladies de l'oreille du Larynx, etc.*)

tinued to date of report, despite intercurrent suffocative attacks from glandular cervical abscesses which had been opened and scraped out upon several occasions.

Inflammatory Nodules of Singers.—

Wagner, of Lille,¹³⁶_{Feb.} has written an excellent paper on the nodules of the vocal bands sometimes observed in connection with the chronic laryngitis of singers, and due, apparently, to use of the voice during the laryngitis. They are usually seen at the anterior portions of the vocal bands as small pin-head nodules, usually bilateral and symmetrical. My own opinion is that they are due to strain at the nodal point of vibration.

They sometimes disappear spontaneously, but more often remain unchanged indefinitely. Wagner states that they may recur, and may even become changed into polyps. They are a result of inflammatory action due to a hyperplasia at first limited to the epithelium, but liable to implicate the entire mucosa. They are to be attacked topically with silver nitrate, chromic acid, or the electric cautery.

These neoformations have long been known to laryngologists; but nowhere, in my recollection, have they been so thoroughly considered as in the article referred to.

Fibroma.—B. Fränkel, of Berlin,⁶⁹_{Jan. 12} reports an instance of

spontaneous expulsion of a fibrous polyp by cough. It had been located beneath the left vocal band, and tracheotomy had been urged on the patient. Hoarseness and dyspnoea had begun in 1862.

Cystoma.—Cystomas have been reported during the year in unusual numbers. Huijsman^{583 319}_{No. 14; 5-p. 29} has reported an instance of cyst of the epiglottis in a man seventy years of age. It occupied the anterior surface and often fell over the edge into the entrance of the larynx. It was extirpated with the electric cautery. It was a simple cyst with endoepithelium.

The case recalls a cyst with a long pedicle, reported by Knight, of Boston, several years ago, which also frequently got caught at the top of the larynx.

G. Hunter Mackenzie³⁶_{July} reports a case of cystic myxomatous growth removed from the left vocal band of a female servant, thirty-five years of age. The whole left vocal band was reddened but not thickened, and from its posterior extremity a rounded sessile growth projected into the glottis (Fig. 4). When removed it proved to be a myxomatous cyst.

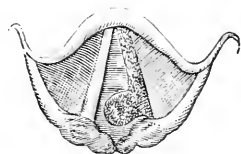


FIG. 4.—CYSTIC MYXOMA.
(*Edinburgh Medical Journal*.)

C. M. Desvernine, of Havana,¹¹⁵⁷ has reported an interesting case of cystoma of the anterior portion of the middle third of the right vocal band of a man, sixty years of age, suffering with carcinoma of the lower third of the œsophagus, who had been hoarse for some months. The patient died, and Desvernine made the most complete histological study of such a case that has yet been reported. The cyst gave exit when incised to a few drops of pure mucoid fluid. The cavity of the cyst measured five millimetres transversely and 3.5 millimetres vertically. Its walls were composed of dense fibroid connective tissue, poorly vascularized and more abundant interiorly. It was found to be a retention cyst of glandular origin due to inflammation beginning in the epithelium of the gland, and progressing excentrically to the paraglandular connective tissue, which had become condensed, layer by layer, with a highly fused fibrous envelope. It is in connection with this case that Desvernine made those interesting histological investigations into the anatomy of the vocal bands which have been referred to on page 1.

Hayward⁶_{Sept. 15} reports a cyst of the left vocal band.

Audubert¹³⁶_{Apr.} reports a cyst of the posterior portion of the left ventricular band of a female, twenty-one years old. It belongs to the class of vesicular polyps (Virchow). It was removed by Moure with Schroetter's forceps.

Seifert¹³⁶_{Mar.} reports a cyst of the left vocal band in a female, sixty-two years of age. It was the size of a nut and was attached to the lower face of the vocal band, but sometimes was thrown up upon it so as to appear as though it projected from the ventricle. It was supposed to be a glandular retention cyst. The patient refused operation.

Angioma.—An interesting and admirably well studied case of cavernous angioma was described and illustrated at the annual meeting of the American Laryngological Association, September, by W. C. Glasgow, of St. Louis, the full description of which has not yet been published, though notices appear in the various journals in their reports of the proceedings.

Enchondroma.—E. F. Ingals,⁹_{Nov.3} of Chicago, reports an instance of subglottic enchondroma which he had nearly conquered at the time of the report with a number of cicatrizations with chromic acid. The solvent action of chromic acid on cartilage has here been happily utilized. The tumor was located just below the anterior commissure, and measured about four millimetres in thickness at its highest part and six to seven millimetres across its base.

Sarcoma.—An instance of sarcoma at an unusual age, eighty-one years, was reported to the Pathological Society, of London, by Felix Semon and S. G. Shattock.⁶_{Apr.7} There was bilateral abductor paralysis with aphonia. Tracheotomy was refused. Two days after its proposal death took place by asphyxia. There was found an extensive but nowhere prominent swelling over the greater part of the laryngeal cavity below the vocal bands, which were involved in the disease and lay almost in apposition. The growth extended through the cricothyroid space and appeared externally. The mucous membrane was villous over a large area of the growth. Microscopy revealed an alveolar sarcoma.

Carcinoma.—The case of the Emperor of Germany, as is well known to our readers, terminated fatally, and proved to be epithelioma, as had been suspected by his German physicians almost from the first. We refrain from entering into the details even of

the clinical points of the controversy between the German and English physicians as displayed in their respective pamphlets.^{1161, 1162} The great lessons taught us are that too much dependence must not be placed upon negative microscopic evidence, and that the neglect to countenance a proposed thyrotomy early in the case, for the purpose of attempting the eradication of a presumptively circumscribed suspicious-looking growth which has proved unamenable to intralaryngeal procedures, may precipitate the most harrowing sequelæ, and possibly deprive a patient of his sole chances for recovery. In the instance in question the disease pursued an unusually rapid course, and reached destructive stages still more unusual; nearly the entire larynx having succumbed to the specific and suppurative processes.

H. Lavrand²²⁰_{Nov. 23} reports an instance of subglottic epithelioma in which there was œdema of the ventricular bands, producing such intense dyspnœa as to have rendered tracheotomy necessary.

W. B. Bannerman²_{Sept. 22} describes an epithelioma of the larynx, complicated with bronchocele, in one of the native Indian soldiers. Death took place from suffocation due to the bursting of an abscess. It will be readily understood that the malignant disease long remained masked by the bronchocele. The abscess had formed underneath a mass of cancerous infiltration exterior to the thyroid cartilage, and had made its way between the cricoid cartilage and the lower border of the wing of the thyroid; and it had burst into the larynx at a point below the arytenoid where a spot of ulceration had been noticed during life. The rarity of abscess in connection with epithelioma is referred to.

An instance of primary carcinoma of the lower portion of the trachea and the right primary bronchus is detailed by Otto Koerner.³⁴_{Mar. 13} It had produced an obstructive atelectasis of the entire right lung. The tumor extended outside of the trachea, and it had attained a bulk larger than the fist. It began in the interior of the trachea, at about the commencement of its lower third, in a nodule the size of a hazelnut, and extended from the right bronchus, which it completely obstructed, in a mass five centimetres in length and two centimetres in breadth and in thickness. It was firmly attached to the wall of the bronchus. Some small tumors were found farther along in the bronchial tract.

It is very rarely that endolaryngeal extirpation of carcinoma

is attempted. Still more rarely is the effort successful. Johann Schnitzler⁶⁹_{Oct. 25} reports a female patient living more than twenty years after endolaryngeal extirpation of a carcinoma. She had been operated upon unsuccessfully twice by Tuerck before she came under Schnitzler's treatment, in July, 1867. The malady began with hoarseness and cough in 1865, and the patient had to abandon her occupation as an actress. She was so anæmic, emaciated, and dyspnoëic as to present the appearance of a consumptive, but exploration of the chest revealed nothing abnormal in the lungs. The vocal bands were reddened and thickened, with small and large gray and red proliferations, of horny aspect, which occupied principally almost the entire free border of the right vocal band, and so occluded the calibre of the glottis that the vocal bands could move only slight distances. Tuerck's diagnosis of epithelioma had been verified by Wedl from microscopic examination of extirpated particles, and the same diagnosis made by Schnitzler was verified by two of Rokitansky's assistants, Biesadecki and Schenthaner. Several applications of the electric cauterium were made in Oppolzer's clinic, until the neoplasms had been thoroughly destroyed and the vocal bands transformed into veritable cicatricial strands. On September 13th the parts looked fairly well, but hoarseness continued, with that peculiar falsetto which is most characteristic of unilateral paralysis. There was still some diminished motility in the right vocal band, but it was of mechanical origin, the arytenoid cartilage being enlarged and the vocal band much smaller and thinner than its fellow, and, furthermore, so overlaid by the ventricular band as to be almost hidden. These conditions were produced by a morbid process which had long subsided. The cure had been complete.

This observation indicates the propriety of attempts to remove malignant growths endolaryngeally when favorably located, inasmuch as no harm can result if the attempts are timely made and properly executed. Success can be expected only when the malady is localized, when the growth has not undergone degeneration, and when there has been no infiltration in the adjoining lymphatic glands. At the same time, not only must the neoplasm be thoroughly eradicated, but the tissues from which it sprang must be effectively destroyed. The best agent for this purpose is the electric cautery. While much hope cannot be given, yet in

some instances life may be prolonged for months and years, and more than this cannot be accomplished by extralaryngeal treatment, whether it be partial resection of the larynx or complete extirpation.

G. Hunter Mackenzie ²⁶July reports an interesting case of endolaryngeal removal of three growths from the posterior third of the right vocal band. The band had a nodular thickening on its anterior third, and from its thickened posterior third there sprung a sessile, fleshy-looking growth which projected into the glottis (Fig. 5). It was removed August 15th, but evinced a tendency to slow recurrence, and on the 7th and 14th of November two other smaller growths were removed. Up to April, 1888, there had been no further recurrence. Laryngeal symptoms were entirely absent, the local and general condition of the patient being excellent. Microscopic examination by Dr. Wolfenden showed the growths to be epithelioma. The section is so characteristic that we reproduce the illustration (Fig. 6) and Dr. Wolfenden's description: "The outermost layers of the epithelium are cornified. The underlying layers are irregularly disposed, large-celled, and the cells contain often more than one nucleus. Some cells show signs of partial division. The vacuolation of the epithelial layers is very marked. Only in a few places is there any line of demarcation between epithelium and stroma. The former dips into the latter, forming characteristic nests of cells or cancer. Some of these are isolated throughout the stroma and base of the growth. The stroma is in most places greatly infiltrated with small cell-growths. The characteristic, so-called epithelial nests are numerous, and occur both in the epithelial layers and in the stroma."

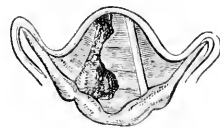


FIG. 5.—EPITHELIOMA OF THE LARYNX. (Edinburgh Medical Journal.)



FIG. 6.—SECTION THROUGH THE GROWTH, SHOWING THE EPITHELIAL NEW FORMATION INVADING THE NON-EPITHELIAL PARTS AND BASE OF TUMOR. (HART-SACK, OBJECTIVE 4, EYE-PIECE 3, TUBE DRAWN OUT.) (Edinburgh Medical Journal.)

Treatment.—The palliative treatment of epithelioma of the larynx and pharynx by the tincture of thuja occidentalis—arbor vitæ—forms the subject of a paper by Baratoux.²⁹⁰ May 12 He gives twenty drops daily at first and increases the dose to three or four grammes (45 to 60 minims). At the same time he paints the parts three or four times a day with an evaporated tincture which is brought to the consistency of a syrup, and to which sufficient glycerine is added to restore its bulk. For tumors or portions of tumors out of sight, sprays of the tincture are used, five parts to ten of glycerine and one hundred of distilled water. This drug has long been in use for carcinoma generally, and is mentioned in this connection in the dispensaries. Profiting by its successful employment in some instances of uterine carcinoma, Baratoux has used it satisfactorily in laryngeal carcinoma. Voltolini recommends the mild Zittman's decoction of sarsaparilla as an excellent remedy in attempts to restrain the progress of carcinoma.

The vexed question of the likelihood that benign morbid growths can undergo transformation and malignancy by intralaryngeal manipulations has received a decided answer in the negative as the result of the careful study by Felix Semon, of London, from records accessible in print, and others furnished him, in addition, by collective investigation from the private records of the great majority of operating laryngologists. These he has, in some part, detailed and criticised in several numbers of the *Internationale Centralblatt für Laryngologie und Rhinologie*, which he so ably edits, but his article has not yet been completed.

Von Ziemssen³⁴ Mar. 8 has reported a case of papilloma of apparently five years' duration, removed from the larynx of a man, aged fifty-seven, who died of heart failure immediately after tracheotomy. It proved to be an epithelial tumor of papillary form with a few characteristics indicative of malignance, and was regarded as an evidence of transformation of a benign growth into a malignant one.

MORBID GROWTHS OF THE TRACHEA.

An instance of sarcoma of the trachea is described by Zemann.⁶⁹ Jan. 12 It is the case operated upon by von Schrötter in 1867 and 1869. The man died of bronchoblenorrhœa October 25, 1887. A tumor the size of a walnut occupied the posterior wall of the trachea.

WOUNDS AND INJURIES OF THE LARYNX.

Gunshot Wound.—Hiero Stoessel reports ³⁷_{June} the case of a man whose larynx was accidentally penetrated October 6, 1887, by a paper obturator from an old gun, at a distance of five paces. The missile was immediately expelled by coughing, and some fragments of cartilage were afterward extracted from the wound. A cannula was inserted through the wound. An attempt to remove the cannula two days afterward was followed by intense dyspnœa and cyanosis, so that it had to be replaced. A fresh fragment of cartilage was removed at the same time. Respiration becoming seriously embarrassed, the patient entered the clinical service of Professor Weinlechner, of Vienna. He was aphonic. Both phases of respiration were slightly stridulous. There was a wound surrounded with excessive granulations in the thyroid cartilage to the left of the median line. The glottis was irregularly quadrilateral, and a whitish prominence projected into the larynx between the slightly tumefied arytenoid cartilages. Another prominence the size of a small haricot bean was located at the anterior angle, at the side of the epiglottis. From the base of the second prominence a reddish-gray membrane stretched to the middle of the right vocal band.

Fracture of the Larynx.—Landgraf ³⁵¹_{Ed. 39, H. 1} ⁴²_{Nov.} reports an instance of fracture in a man, aged thirty-eight, who received a blow from behind. In falling he struck his neck against the corner of a table. Death ensued in three days. There was a horizontal fracture of both thyroid cartilages, with separation of their anterior commissure. The interior of the larynx was the subject of several suggillations.

Barendt ⁶_{Mar. 3} ⁴²_{Nov.} reports a case from a blow from the elbow of a playmate at football. Great emphysema ensued. There was also crepitation and pain on palpation of thyroid gland. Puncture was made to relieve the imprisoned air, with relief to the dyspnœa. Subsequently laryngotomy became necessary. During its performance the left wing of the thyroid cartilage was found broken, but not separated from its fellow. Death occurred on the thirteenth day, from pneumonia.

FOREIGN BODIES IN THE AIR-PASSAGES.

The usual variety of foreign bodies in the air-passages have been reported, some removed by operative procedure through the natural passages, some after external incision. Of cases of long

continuance von Vámosy¹¹³_{Dec. 25, '87} reports a case of sewing-needle which had been ten months in the larynx of a tailor. Complaint was made at once on swallowing the needle, when with a pair of forceps Vámosy seized a bit of thread in the eye of the needle and removed it, but was unable to get the needle. Nevertheless, all symptoms of cough and titillation ceased. Ten months later the needle was expelled by cough.

A cockle-bur was removed with forceps by Glasgow, of St. Louis,⁶⁵_{Mar.} from the larynx of a negro child, ten years of age, after using a 10 per cent. solution of cocaine. This was the third cockle-bur that Dr. Glasgow had seen in the larynx.

Thyrotomy has been performed by Archambaud²⁴³_{Jan. 9} to remove a fifty-centime piece from between the two ventricles, efforts at removal by the natural passages having proved futile. Also by Godet²⁴³_{Dec. '87} for the removal of a leech which for twenty days had caused "spitting of blood," hoarseness, and sensations of a foreign body.

J. W. MacDonald¹⁰⁵_{Apr. 15} reports the case of a bridegroom who inhaled a rabbit-bone at his wedding-dinner. It passed beyond the larynx and would be thrown up into the larynx in coughing, but no further. Laryngo-tracheotomy was performed, and the body was pushed through the glottis with a probe into the mouth, whence it was extruded in an effort of emesis.

The importance of provisional tracheotomy before performing laryngotomy for removal of foreign bodies of irregular shape has been illustrated in a case reported by Labbé, of Paris,³_{Mar. 21}. A child had inhaled a sharp-pointed metallic star, which could be seen impacted between the vocal bands. Intralaryngeal procedures for removal failed. Labbé split the larynx without having performed precautionary tracheotomy and removed the foreign body, but at the moment of withdrawal two drops of blood flowed into the trachea and produced such frightful suffocation that immediate tracheotomy had to be performed. Although the tracheotomy was accomplished in less than a minute, artificial respiration had to be maintained for three-quarters of an hour before the patient was safe.

NEUROSES OF THE LARYNX.

Hysterie Aphonia.—An hysterical aphonia cured by hypnotism in a clinic of our corresponding editor, Professor Massei, of Naples,⁵¹³_{Apr.} is mentioned by Cardone.

Laryngeal Vertigo.—Ed. Weill³⁰⁴_{Dec. 3, '87} reports a case of laryngeal vertigo in a man aged forty-five, vigorous, obese, and alcoholic, but without hereditary antecedents. Eight years previously he had had frequent attacks of asthma for the first time. During the last six years the paroxysms had become separated at longer intervals, and emphysematous bronchitis had been developed. Nothing peculiar was detected in the lungs or in the urine. At each attack of asthma, in addition to a continuous oppression which lasts for several days, there is a paroxysmal spasmodic cough of from ten to sixty minutes' duration, repeated several times a day. This cough is preceded by tickling sensations in the throat, and is sometimes accompanied by sensations of asphyxia. Sometimes the laryngeal titillation provokes several succussions of cough, and then under the habitual dread of asphyxia the head falls very rapidly on the breast, and consciousness is lost for about two seconds. As the head is raised the right upper extremity becomes agitated by clonic movements for several seconds, during which time there is a sound in the right ear as of a cascade, both manifestations subsiding simultaneously. The attacks of vertigo are always produced under the asthmatic influence, and the losses of consciousness occur in the non-asphyxious paroxysms.

Phonic Spasm of the Larynx.—In an article on phonic spasm of the larynx, Paul Koch³⁷_{Mar} reports two instances in patients, the subject of goitre involving the right lobe of the thyroid gland, one a woman, aged sixty-three years, and the other a girl of eighteen years. He refers to similar cases reported by Jonquière and by Schech. These instances he cannot regard as simple coincidences, and he therefore suggests that parenchymatous goitre may be a cause of spasmodic tension of the vocal bands, admitting with Jonquière that the irritation of the recurrents produced by compression in combination with some irritation of central origin may produce, by way of the inferior laryngeal, a phonic spasm which neither of these two factors could produce alone.

Paralyses.—Numerous papers concerning laryngeal neuroses, especially paralyses, we must leave unnoticed, both for want of space and for their lack of novelty. We desire, however, to call special attention to two very important papers by Jelenffy, of Budapesth, a short one on the electric contractility of the laryngeal muscles after death,⁴_{No. 26} and an elaborate one on the anatomy, physi-

ology, and pathology of the laryngeal muscles,⁴ both in support of views previously advanced by him⁸⁴₁₈₇₂ to the effect that permanent median position of the vocal bands with practically unimpaired conservation of the voice indicate spasm or contracture of all the laryngeal muscles, including the dilator muscles proper, the posterior cricoarytenoids.

It will be remembered that some recent physiological experiments by Semon and Horsley, of London, upon the excised larynx, showed that the posterior cricoarytenoid muscles lost their electric contractility long before it was lost in the other laryngeal muscles. Jelenffy attributes this result to the exposed position of the muscles and their consequent more rapid cooling off, and he claims to have prevented it entirely by keeping the muscles warm, so that they all lose their contractility at about the same moment when they are all kept at the same temperature. For details and arguments we must refer to the original.

The more elaborate paper, which comprises forty-six pages in its reprint, is a study on the diagnosis to be made in cases of permanent median position of the vocal bands. Jelenffy calls attention to the fact, long ago announced by him, that due longitudinal tension of the vocal bands cannot be secured without contraction of the posterior cricoarytenoid muscles, which must fix the arytenoid cartilage in position before the cricothyroid muscles can stretch the vocal bands to produce the rising inflections of the register. Hence he argues that whenever the singing voice is preserved there must be contraction of the constricting muscles of the glottis. Consequently there can be no paralysis of those muscles when this position occurs in consequence of irritation simply of the recurrent nerve, and the position is therefore due to the simultaneous contracture of all the muscles of the larynx supplied by that nerve, in obedience to the general law that irritation of a motor nerve produces contraction of the muscles it supplies and not paralysis. Normal voice requires fixation of the arytenoid cartilage, and this fixation cannot take place without the co-operation of the muscle in question. The fact that atrophy of this muscle often takes place within a few days after its immobility is established, and which has been urged as an argument in favor of its paralytic condition, is explained by Jelenffy on the score of the increased innervation of the muscle by the efforts of the patient to keep his glottis open, and he

cites authorities in support of the view that immoderate or excessive innervation is, more than anything else, the cause of such rapid degeneration of the muscle. The degenerations in the recurrent nerve found in many cases of this nature is attributed to secondary influences, the result of its being put out of function, so that, the nerve-fibres going to the posterior cricoarytenoid becoming superfluous when that muscle has undergone atrophy, they are put out of function and undergo degeneration. This is, in brief, the theme of the argument, which is well maintained, but for details of which, as well as for the method of recognizing contractures from paralyses of the posterior cricoarytenoid by careful inspection and interpretation of the laryngoscopic image, we must refer our readers to the original.

Two novel diagnostic features have been announced during the year, neither of them in the domain of laryngoscopy. One, indicative of the location of the lesion in some cases of paralysis of the posterior cricoarytenoid muscles, is presented by Ed. Aronsohn, of Berlin, ⁶⁹ June 23 in acceleration of the pulse in all cases due to disease in the nerve supply proper. When there is no acceleration of the pulse the inference remains that there is organic disease behind the point where the recurrent separates off from the pneumogastric. The acceleration of pulse indicates paralysis of the cardiac branches of the spinal accessory.

Our distinguished collaborator, Charles Fauvel, of Paris, writes us of the other novel feature. He says that each time that he examines with the laryngoscope a patient affected with paralysis of a vocal band, whether the left or the right one, he is immediately struck with an odor *sui generis* exhaled from the mouth of the patient. This odor, recalling somewhat that of ozæna, is so characteristically pathognomonic that it never deceives him, so that he is always able to diagnose the malady before the laryngoscopic examination is made. Whether the paralysis be the consequence of an aortic or brachiocephalic aneurism, or the consequence of a bronchial adenopathy, or of central origin, or syphilitic, this odor *sui generis* always accompanies the paralysis of a vocal band. He thinks that a physiological study is certainly desirable in this connection. He attributes the odor to stagnation of the bronchial secretions which cannot be expelled, and which acquire this bad odor like the stagnant nasal mucosities do in cases of ozæna. This

explanation is advanced for what it may be worth, but what he particularly desires to make known to his colleagues is the fact itself, and to direct their attention to the subject in hopes of learning its scientific explanation.

Eisenlohr ^{368 54}_{Ed. 19, H. 2; Aug. 15} describes a third case of laryngeal paralysis from circumscribed disease of the medulla oblongata. During the entire course of the disease, absolutely continuous unilateral motor and sensory laryngeal paralysis was the most prominent symptom. There was complete left-sided paralysis of the recurrent nerve, with complete loss of direct and reflex sensibility of the left side of the larynx. Fluids regurgitated through the nose and penetrated into the larynx on swallowing. There was marked left-sided paralysis of the soft palate, with diminished direct and reflex sensibility. At the end of three years death occurred from putrid pleuropneumonia. A circumscribed focus of disease was found in the left half of the medulla reaching from the upper cervical region to the level of the nucleus of the abducens.

Vilato ^{494 136}_{Mar. 15; Oct.} reports a case of dysphonia, paralysis of the right half of the palate, of the tongue and of the larynx, and of the upper and lower limbs, in a girl seven years of age. The diagnosis was general paralysis following diphtheria. Radical cure was obtained by several séances of hypnotism. Lacoarret justly attributes the paralysis to hysteria.

TRACHEOCELE.

Our corresponding editor, Dr. Helferich, of Griefswald, calls attention to three cases reported by Burekhardt, ¹³³_{No. 13} in one of which, however, the operation revealed a substernal goitre with dilatation of the large veins of the neck which had simulated tracheocele.

FETID TRACHEITIS.

Under the caption "Tracheal Ozaena," Luc ²⁸⁶_{Feb.} describes three cases of a condition long mentioned in some of the text-books on diseases of the throat as fetid laryngotracheitis, following fetid ozaena. Two cases were in females; one in a male. Viscid crusts were adherent to the walls of the trachea, which, when expectorated, were found similar to the crusts of nasal ozaena in odor, in color, in consistence, and in micro-organism. This condition sometimes attends catarrhal inflammations of the vault of the pharynx,

the secretions being inhaled into the larynx, and detained in the ventricles or elsewhere.

TRACHEOTOMY.

Very little that is novel has appeared during the year on the subject of tracheotomy. The value of early operation without awaiting alarming symptoms in cases of considerable obstruction in the larynx and upper portion of the trachea is becoming more generally recognized. An exception may be stated with regard to cases of ulcerative tuberculous laryngitis, concerning which the consensus of opinion tends rather against the operation for mere purposes of putting the larynx at rest. Here it is considered better practice to await at least the threatening of symptoms of dangerous dyspnoea. The great importance of attention to the case after the operation as one of the elements of success in tracheotomy for croup and diphtheria is exemplified in a number of articles, and especially in papers by Thorn³⁶_{Sept.} and by Parker.³⁶_{Nov.}

Among accidents during operation we notice a record by Sørensen, of Copenhagen,³⁷⁵_{June 19;}¹¹_{Oct.} of five instances of division of the posterior wall of the trachea which have occurred during the past four years, during five hundred and two tracheotomies for croup and diphtheria at the Copenhagen Hospital for infectious diseases.

An interesting case in which tracheotomy failed to relieve an obstruction that subsequent manipulation proved to have been due to an abscess above the bifurcation has been reported by E. A. Wright,⁶_{Sept. 20} and attributed by him to probable abscess in a bronchial gland which pointed into the trachea. An eggcupful of most offensive matter had been discharged by rupture of the abscess with a gum catheter armed with a stylet which was being used for exploratory purposes. I have met with a similar instance in a syphilitic subject, in whom I ruptured an abscess by forcing a dilator down to the bifurcation, and thus rescued the patient.

Stenosis and the Removal of Membranes after Tracheotomy for Croup.—Pienazek, of Cracow,¹⁵⁸_{BA. 10, II. 1;}¹³_{Oct. 15;}¹¹_{Oct.} places an ear speculum or a shortened Zaufal speculum in the fistula, turns the head back, introduces a mirror, and tries to see where the obstructing membranes are. He has often succeeded in seeing them, and he believes that he has reached them as far as in the bronchial tubes of the second order. He uses either von Schroetter's laryngeal forceps, or an ear-scooped flexible probe. He describes four cases saved

from death by this method. In one instance he recognized a cicatricial ring in the trachea, and in others granulations as the causes of stenosis. The latter were cured by electro-caustic measures.

Tamponing the Trachea.—J. Michael⁴_{Sept. 10} described a method of tamponing the trachea by placing compressed sponge around the cannula and covering it with parchment foil. This cover he regards an essential portion of the procedure, as without it the sponge acts as a filter and allows fluids to trickle into the bronchial tract. Hence the failure of the tamponade with uncovered sponge. Michael recommends the surgeon to compress his own sponge in preference to using the article bought in the shops, which he has found unreliable for this purpose. The compressed sponge is to be saturated *in situ* with water or glycerine injected from a hypodermic syringe, the nozzle of which pierces the covering without detriment to the process. He has thus tamponed a case of sphaculating laryngeal carcinoma with three perforations between the trachea and the œsophagus, for fifteen months, with five weeks' intermission after the perforations had closed; and after the patient's death from marasmus the trachea was found intact and the lungs sound. He also recommends covering the cannula with drain-tubes when the wound is large enough. This method is absolutely safe. It likewise prevents ulceration from the end of the cannula. In removing these tampons, Michael recommends the adoption of the position with the head pendant, so that any fluids above the tampon escape by the mouth and the fistula.

THYROTOMY.

In his study of Bruns' table of thyrotomies since 1878 Albert Hoffa⁴_{Oct. 22} finds that of ninety-four operations only four terminated fatally, one by pyæmia and one by diphtheria, both of which might have been avoided under efficient antisepsis, and two by hæmorrhage into the lungs, in one of which the trachea was not tamponed at all, while the tampon cannula ruptured in the other. The necrosis of cartilage theoretically feared did not occur in any instance. Of sixty of these cases the voice remained normal in thirty-nine, became hoarse in fifteen, and aphonic in six. In a later paper based on one hundred and four collations of operations performed since 1879 or the period in which antiseptic surgery has been practiced, Hoffa¹¹⁶_{Nov.} shows most conclusively that thyrotomy

is not at all a dangerous operation, and that the results are altogether dependent upon the character of the lesion for which it is performed, while its effects upon the voice are dependent solely on the seat of the lesion and on its special character.

LARYNGECTOMY.

Death by Shock.—The so-called shock to which some patients have succumbed after laryngectomy is attributed by Stoerk⁸⁴_{No. 12} to cardiac paralysis, due to the change produced in the innervation of the heart by the section of the fibres of the inhibitory cardiac branches of the pneumogastric nerve, which in these cases have coursed forward toward the larynx and thence down the trachea. He therefore counsels careful separation of the tissues of the pharynx, keeping close to the cartilage, so as to avoid these cardiac branches.

Phonation without an Artificial Larynx.—An interesting example of satisfactory phonation after laryngectomy without the aid of an artificial larynx is reported by Hans Schmid.⁶⁹_{Oct. 18} The entire larynx, epiglottis included, had been removed for supposed carcinoma by Ziegel, October 28, 1886.

On August 4, 1888, Schmid exhibited the patient at a meeting of the *Greifswalder Medicinischen Verein* to show that he spoke without the aid of an appliance. The voice, though monotonous, was loud and distinct. The tongue, tonsils, and palatine folds seemed to have acquired the facility of so arranging themselves as to constitute a substitute for the vocal bands. Subsequently Strübing⁶⁹_{Dec. 27} studied the case carefully with Schmid and attributed the occurrence to the production of a sac formed from the walls of the tissues whence the larynx had been removed, the air in which was compressed by the musculature so as to be driven with force in a staccato manner against a slit formed by the base of the tongue and the posterior wall of the pharynx, the edges of which acted as the reed which formed the pseudoglottis.

E. Küster⁴_{Nov. 19} exhibited to the *Berliner Medical Gesellschaft* a man, fifty-five years of age, from whom on August 31st, his assistant, Dr. Barth, had extirpated one-half of the larynx for carcinoma, leaving the cricoid cartilage intact. The voice was very good. He showed a larynx from another patient, a man fifty-seven years of age, from whom he had removed the other half for carcinoma on

September 10th. Two days earlier he had removed some carcinomatous cervical glands. The superior laryngeal nerve was severed. Bronchitis ensued, but ceased after the excision of the diseased half of the larynx. Three weeks later purulent bronchitis ensued and death from pneumonia took place seven weeks after the operation. It required some inspection of the preparation to recognize that one-half of the larynx had been removed. Küster called attention to three points: 1. He always sought to preserve the cricoid intact in unilateral extirpation. 2. Glandular infiltration was more frequent than it was generally thought to be. He had performed one complete laryngectomy and four unilateral ones, four for carcinoma and one for carcinomatous mixed tumor. Glandular infiltration had existed in three cases out of the five. 3. Section of the superior laryngeal nerve seems to produce bronchitis even when the larynx or trachea is not opened; and sometimes it leads to fatal pneumonia. The cessation of the bronchitis in his case, as soon as the excision of the larynx had been accomplished, seemed to indicate that the cases of bronchitis in question were attributable to the penetration of mucus and other matters on account of the abolition of sensibility in consequence of the section of the superior laryngeal nerve.

Schede ³⁴_{Nov. 27} exhibited, November 20, to the members of the *Aerztlicher Verein*, in Hamburg, a woman from whom he had removed the entire larynx four and one-half years previously for carcinoma. Tracheotomy had been performed in April, 1884, and the laryngectomy in the following June. In October a small recurrence in the cicatrix had to be removed. Since that time the patient had remained well, and was able to do her housework. She wore a Bruns' chimney cannula, and spoke with a distinct falsetto voice. He reported, further, that his first case died of pneumonia thirty-months after the operation, and that there had been no recurrence. The patient had been able to fully resume his professional labors as a dentist. Another man, fifty-five years of age, on whom he had operated, died one year later from a local recurrence; and another, aged sixty-five years, died two years after operation from an inoperable gland carcinoma of the neck.

Vincenzo Omboni ¹⁸⁰_{Aug.} relates in detail a case of extirpation of the larynx with the first wing of the trachea, a portion of the pharynx, and the cervical and a portion of the mediastinal portion

of the œsophagus of a woman, forty-six years of age, for epithelioma. The operation occupied four and three-quarter hours, but was practically bloodless, owing to the use of about one hundred and fifty ligatures and the liberal use of the thermocautery. The trachea was severed anteriorly in four-fifths of its extent, its lower portion secured to the inferior margin of the cutaneous wound, and then the posterior fifth was severed with the thermocautery. The patient did well for a time and wore an artificial larynx; but was attacked with erysipelas on the thirtieth day and died eleven days later.

Of operations reported during the year the following are of most interest: Unilateral laryngectomy for carcinoma by O. Riegner, of Breslau, has been reported by Richard Kayser.⁶⁹_{Nov. 8} A man thirty-five years of age had been well up to the summer of 1887. Eight years previously he had a specific ulcer and a temporary exanthem. His father had died at thirty-six with diabetes; his mother was still living. A paternal aunt had had carcinoma of the uterus, the only case of carcinoma known in the family. The patient's voice had been used considerably in politics, but there had been no disposition to hoarseness or catarrh of the air-passages. Moderate smoking had been indulged in, but alcoholic beverages had not been used. Trouble with the throat began late in June, 1887. Laryngoscopy revealed only moderate hyperæmia. Increasing hoarseness began in July. In September, congestion of the vocal bands was noted, with thickened border of the right band, swollen arytenoid of that side and swollen interarytenoid fold. In January, 1888, dyspnoea became marked, and on the 28th tracheotomy was performed high up. January 31st, the right vocal band was found thickened, reddened, and immobile, the left band reddened, the rima glottidis filled with a pale-red, smooth tumor, without any trace of ulceration. March 12th, a portion was removed with forceps and found, on microscopic examination, to be malignant. March 20th, the right half of the larynx was removed. Recurrence took place at the upper portion of the trachea. This portion was removed March 27th, seven days after the main operation. Singultus, which had begun four days after the laryngectomy, continued; sensory disturbances took place; agraphia became manifested, and death ensued by cardiac paralysis on March 29th, nine days after the main operation.

O. Riegner⁹⁷_{Mar.10} reports a complete laryngectomy for cornifying epithelioma, in which he had to divide the trachea just above the sternum and to remove a portion of the pharynx and œsophagus. The patient, a man, sixty years of age, was operated on March 8th, and was doing well at the time of the report. The early date of the report was in consequence of the necessity of correcting some statements which, to the operator's regret, had been made in the political daily press. The case is mentioned here because the low division of the trachea renders it interesting in connection with the study of a similar section to be described in the following and successful case:—

Stetzner, of Dresden,²⁴_{Nov.18} has performed a total extirpation of the larynx and the suprasternal portion of the trachea for epithelioma with recovery. A male, aged twenty-seven, had been tracheotomized, June, 1884, for extreme dyspnœa attributed to perichondritis. In 1887 the patient begged some operation to relieve him of his cannula. Laryngoscopy revealed nothing positive besides great chronic thickening of the vocal bands. Nevertheless, an operation was undertaken February 9, 1887, under the belief that there was a subglottic tumor. An incision in the middle line from hyoid bone to cricoid cartilage revealed a tumid mass, partly solid, partly fungous, and in decomposition, occupying the position of the larynx, and containing only fragments of the laryngeal cartilages, while the vocal bands and mucous membrane were unrecognizable, and there was no perceptible lumen. There was no line of demarcation between the tumor and the parts adjacent, but the tumor could be followed as high as the hyoid bone and as low as the inferior portion of the thyroid gland. A very low tracheotomy was performed, the morbid mass was removed, and the adjoining tissues trimmed with scissors, bistoury, and sharp spoon as thoroughly as practicable until the absolute limitation of morbid tissue had been passed. The suprasternal portion of the trachea presenting cancerous infiltration of its walls, it was divided horizontally at the level of the sternal notch immediately above the cannula. Thus a large space was left, limited above by the hyoid bone and below by the sternum, in the upper portion of which was the œsophageal orifice and at the lower the transverse section of the trachea. The trachea was secured by two rows of sutures to the cutaneous border of the wound to prevent its recession into the

thorax. A long cannula was inserted into the trachea, and an elastic sound into the œsophagus. At the end of twenty-three days an artificial Gussenbauer larynx was adjusted and it acted admirably. The sense of smell, which had been lost for years, returned after respiration through the nose had become re-established by the appliance. The patient was discharged March 21st, and up to date had shown no evidence of recurrence.

Vincenzi Omboni⁴⁸⁰_{Aug.} has reported a case of extirpation of the larynx and first ring of the trachea, together with a portion of the pharynx and œsophagus, for epithelioma. The patient was a man forty-six years old. The operation was performed June 28th. Death took place on August 8th.

Edwardo Boccomini⁶¹⁶_{Nov.} ¹⁷_{Nov. 22} successfully extirpated, September 25th, the entire larynx of a man, aged fifty-four, for cancer. Median incision, detachment from soft parts with spatula, separation from trachea, detachment from pharynx, then from thyrohyoid membrane. He commenced by introducing a large celluloid cannula, which completely occluded the cavity of the trachea, then gave chloroform. A Faucher tube was introduced into the pharynx and œsophagus for alimentation. A dressing of iodoformed gauze was placed over all.

In a complete laryngectomy for carcinoma reported by Le Dentu¹⁰⁰_{July 24} recurrence took place in three months and death ensued by cachexia. In another by Omboni⁴⁸⁰_{Aug.} the patient, a male, aged forty-six, died on the thirty-ninth day.

Complete laryngectomy for sarcoma has been reported by Caccioppoli⁵¹³_{Mar.} death having occurred from marasmus one month thereafter with recurrent growth in the tissues of the wound. Our corresponding editor, Professor Massei, of Naples, who was present, writes us of the masterly manner in which the larynx and six rings of the trachea were removed. A female, aged fifty-two, had a sarcoma of the thyroid weighing nine hundred and sixty grammes, removed in December, 1887. Three weeks later a recurrence was attacked by scraping and cauterization. Subsequent recurrence necessitated a very difficult operation, during which it became evident that the tumor was adherent to the thyroid and cricoid cartilages and to the first ring of the trachea. On February 7, 1888, a new tumor was found involving the right half of the thyroid cartilage, and on February 19th the extirpation

was performed. This was the thirteenth laryngectomy practiced by Italian surgeons.

AFFECTIONS OF THE ŒSOPHAGUS.

Phlebectasia and Varix of the Œsophagus.—Our corresponding editor, Dr. Mygind, of Copenhagen, calls attention to a thesis of C. A. Blume, of Copenhagen, on this subject. The author studied the distribution of the œsophageal veins by injections into the veins and into the abdominal organs, both isolated and in position. He finds that the submucous veins empty into the coronary vein of the stomach, while the peri-œsophageal reticulum is in communication with the veins of the diaphragm, with the azygos or demiazygos vein. The internal and external œsophageal plexuses form numerous anastomoses between the veins of the portal system and the vena cava. If there is a cirrhosis of the liver, varicosities of the œsophageal veins are formed, and a greater communication between the coronary veins and the vena cava. He has observed this in fifteen cases. Hæmorrhages are often seen, occasioned either by ulceration of the mucous membrane or by hyperdistension of the varicose veins. These hæmorrhages may take place in all the stages of the cirrhosis, even at a period when the disease is not manifested by any other symptoms. When the hæmorrhage is due to a rupture of the varicose veins, the blood is ordinarily expelled by a sort of regurgitation without vomiting. In cases of cirrhosis of the liver, where varicosities of the œsophageal veins are formed with increased communication between the portal vein and the vena cava, the appearance of the ascites is always retarded, the same as the stasis of blood in the spleen, while the secondary alterations in the stomach and the intestines do not seem to be influenced.

Foreign Bodies in Œsophagus.—Dr. Créquy¹⁰⁰_{Nov. 5} recommends tangling up a skein of thread and tying it in the centre with a strong thread forty to fifty centimetres long, covering the mass with some agreeable confection, and letting the patient swallow it. As soon as it is supposed to have passed the foreign body it is drawn out. He has succeeded with this device in several instances. In one the traction was useless, but the presence of the skein provoked emesis and the foreign body, a rough object, was ejected. He considers it probable that the mass, dilating the œsophagus, detached its walls from the asperities of the foreign body.

Removal of Foreign Bodies.—Œsophagotomy for the removal of foreign bodies has been reported by several surgeons. Of these we may mention operations by M'Ardle, ¹⁶_{Apr.2} who removed two pieces of bone from the upper end of the thoracic portion of the œsophagus, with recovery; the President of the New York Surgical Society, ¹_{June 30} who successfully removed a bone-handled tooth-brush six inches and three-quarters long; de la Sota, of Seville, ⁶⁴_{Jan.16} our corresponding editor, who removed a chicken-bone from the œsophagus of a nun after twenty days' sojourn, and a portion of the vertebra of mutton from a gypsy after one month's sojourn. Three months were required to complete the cure in de la Sota's first case, and three weeks in the second. He condemns all violent efforts to extract irregular bodies or to push them down, and recommends external operation as soon as possible. He considers suturing the œsophagus probably useless, and permanent retention of a catheter pernicious (report of Dr. Chiralt, of Seville, Spain); H. H. Clutton, ⁶_{July7} who successfully removed an impacted denture.

ŒSOPHAGOTOMY.

Our corresponding editor, Dr. Diakonoff, of Moscow, Russia, calls our attention to a report by S. W. Baloujeff, ⁵³⁰_{V.30,p.227} of three cases of œsophagotomy for foreign body by Sklifossowsky, of Moscow, some features of which are peculiar. 1. A female, aged forty-three years, had received the injury four years previously in swallowing a bolus of meat. During the entire period she had been unable to swallow solids. On examination, October 11, 1887, she presented a parenchymatous goitre, a stricture of the œsophagus, a fistula the orifice of which was above the fourchette of the sternum, and a foreign body at the base of the fistula. Operation on November 13th. Some fragments of bone, the largest of which was about two centimetres in length, were found behind the left lobe of the thyroid gland outside of the œsophagus. After extraction of the fragments the wound closed without any complication. The stricture was dilated with bougies. Complete cure. 2. A male, aged forty-two years, swallowed a fragment of bone November 17, 1885. Hypertrophied thyroid gland. Œsophagotomy November 19, 1885. A semicircular fragment of bone was extracted three centimetres long and one and a half centimetres broad and three-fourths centimetre thick. The lips of the

œsophageal wound were sutured to the skin. The patient was nourished by means of a long drainage tube passed through the wound. Recovery ensued, but a fistula remained, which closed soon after a second operation. 3. The patient, aged fifty-five years, swallowed a plate with two teeth January 27, 1885. Œsophagotomy January 30th. Eight days after the operation a hæmorrhage, which recurred several times. Death February 10th, from acute anæmia. The autopsy revealed an ulceration of the posterior wall of the œsophagus and a purulent posterior mediastinitis.

Diakonoff also calls attention to the operation of œsophagotomy and endothoracic resection of the œsophagus proposed by J. Nassiloff⁵⁸⁶_{No.25} for foreign bodies and for carcinoma. An incision through all the soft tissues is made parallel to the internal border of the scapula seven to nine centimetres from the line of the spinous processes. Two other incisions are made at the two extremities of the first one. The flap being detached, four ribs are resected one after the other. The pleura is carefully separated from the ribs and entrance is thus made into the posterior mediastinum. The œsophagus is now to be isolated, an œsophageal sound being introduced first if desired or if required, and raised on a soft hook. The operation may now be continued in two ways: (a) if for foreign body, the œsophagus is seized with two pairs of forceps, is incised, and, after the foreign body has been extracted, closed with the interrupted suture; (b) if for neoplasm, the œsophagus is secured by ligatures placed above the neoplasm and below it; the œsophagus is resected and then united by suture after the method of Czerny. If the neoplasm is very extensive, it is proposed to simply cut the œsophagus and unite its inferior extremity to the skin by suture. The final step of the operation consists in re-covering the wound with the flap of soft tissues.

Œsophagismus.—Borgiotti³¹⁹_{No.34}¹⁵ reports a case of hysterical œsophageal spasm in a female servant, thirty-one years of age, which continued uninterruptedly for five hundred and thirty days. It could only occasionally be overcome with the sound, and but rarely permitted the passage of liquid nutriment. The portion affected corresponded with the dorsal spine from the fourth to the seventh vertebræ, where the passage of the sound was always painful. With one of Verneuil's œsophageal dilators especially constructed for the case, a cure was effected within a few days.

Stricture of Œsophagus.—Our corresponding editor, Robert Coltman, of Chinanfoo, China, writes us that he finds stricture rather common in that province. It is attributed by some native physicians to drinking "Shao Chin," the favorite wine, which is simply an unrefined alcohol, rich in fusel-oil, distilled from broom-corn or from rice. It is always heated before drinking, and often sipped continuously at meals. Chronic inflammation ensues, with hyperplasia and stricture at the cardiac orifice. In five cases of stricture treated by Dr. Coltman, this drink could not be ascribed as the cause. One marked case of presumptively syphilitic stricture was brought to the dispensary on a stretcher, too weak to stand and scarcely able to speak. The man had not taken food or drink for six days. He was treated by pumping milk with ten grains potassium iodide into his stomach and then pumping soft food into the stomach three times daily for a month, by which time he was apparently cured. The other four cases were treated similarly with similarly good results, although they denied having had syphilis. One patient, a female, was taken with great pain a few hours after introduction of the stomach-tube and died in two days, apparently of peritonitis.

E. T. Painter, of Pittsburgh,²⁰⁷_{Oct.} reports a case of stricture immensely relieved by a series of topical electrizations, the positive electrode being some absorbent cotton in a shell of perforated hard rubber, in the œsophagus, and the negative electrode, a sponge, held in the hand.

Carcinoma of the Œsophagus.—Treatment of carcinomatous stricture by dilatation with permanent retention of catheters made of English bougie material is highly indorsed by Ludwig Wolff.¹¹⁶_{Nov.} Kirmisson,¹⁴_{July 4} prefers it to gastrostomy. On the other hand, Nicaise and others prefer gastrostomy. J. Collins Warren,⁴³_{Jan.} regards the chief objection to gastrostomy to be the difficulty in the management of the fistula so that there shall be no leakage. He reports a case in point which illustrates the difficulties. Koehler, of Cincinnati,⁵³_{Mar. 10} reports a gastrostomy in which the patient died thirty hours after the stomach was opened, and gives a detailed account of the case, together with extensive observations on the subject of cancer of the œsophagus and the operations for relief. He considers gastrostomy the best measure for temporary relief if œsophagotomy is out of the question, and that it should

be performed as soon as deglutition has become considerably obstructed.

Dr. Knie, of Moscow, ²¹_{Sept. 10} reports a successful case of œsophagostomy for œsophageal cancer in a female, aged fifty-four years; the patient dying sixteen months later by hæmorrhage from a tracheotomy wound which had become necessary two months after the œsophagostomy.

NEW INSTRUMENTS.

Our corresponding editor, Dr. G. N. Scott, of Moscow, Russia, calls our attention to a suggestion of Zalesky that the tracheotomy

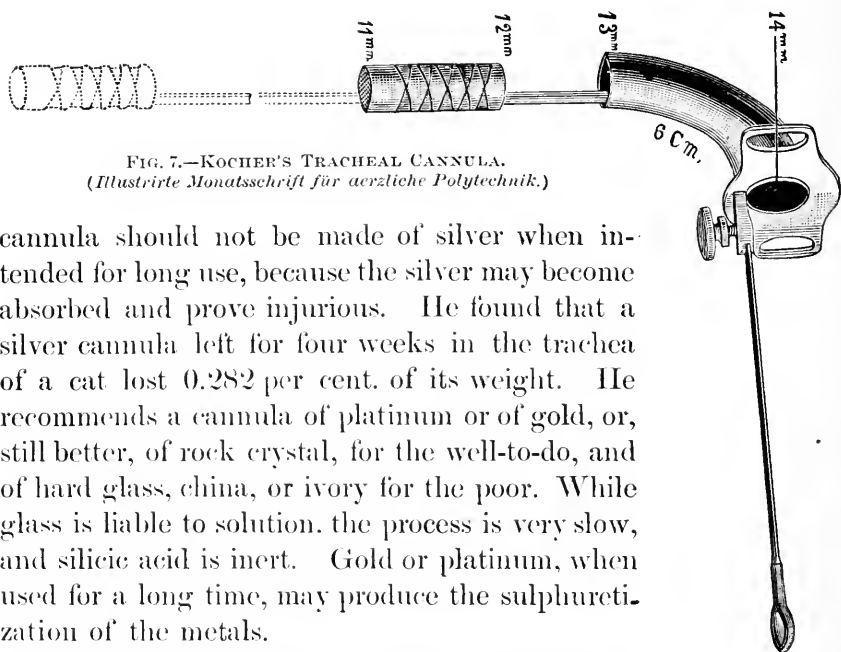


FIG. 7.—Kocher's TRACHEAL CANNULA.
(*Illustrirte Monatsschrift für ärztliche Polytechnik.*)

cannula should not be made of silver when intended for long use, because the silver may become absorbed and prove injurious. He found that a silver cannula left for four weeks in the trachea of a cat lost 0.282 per cent. of its weight. He recommends a cannula of platinum or of gold, or, still better, of rock crystal, for the well-to-do, and of hard glass, china, or ivory for the poor. While glass is liable to solution, the process is very slow, and silicic acid is inert. Gold or platinum, when used for a long time, may produce the sulphuretization of the metals.

In this connection it may be stated that. Sajous, of Philadelphia, no longer recommends cannulas of aluminium, having found them positively irritating at every point of contact with the tissues. The tendency of the metal to disintegrate in thin, sharp scales adds an element of danger. The difficulty frequently experienced in withdrawing the inner cannula from the outer one is believed by Dr. Sajous to be due to a peculiar adhesiveness acquired by the secretions through the action of the metal, which also renders difficult the proper cleansing of the instrument.

Tracheal Cannula for Deep-seated Stricture.—Kocher ⁷¹_{June} has

devised a new cannula for deep, circumscribed constrictions of the trachea such as are produced by aneurisms and tumors. The outer and upper portion, which represents an ordinary cannula, carries a slot on the inner surface of its cavity, in which a strongly nickel-plated steel director works back and forth. This director carries a four centimetres long inner, articulated cannula, which can be readily passed to the point of stricture. After dilatation and tubage of the stenosis the steel collar can be fixed in position with a set-screw. The cannula can then remain days and even weeks in the dilated passage without injuring the healthy mucous membrane. The borders of the lower and upper opening of the intubating cannula are rounded off and turned inward so as to facilitate movement and avoid injury. The entire length of the cannula with the steel collar is twenty-one centimetres. If an opening is made in the convexity of the upper cannula it can readily be arranged for speaking purposes.

Our esteemed corresponding editor, Dr. Gouguenheim, of Paris,¹¹⁵⁸ presented to the American Laryngological Association, in September, a description of a long cannula with spiral extremity devised by him for cases of stenosis low down.

An ingeniously contrived substitute for tracheotomy and the cannula was presented to the same Society by Holden, of Newark, consisting of a bivalved speculum to be thrust through the crico-thyroid membrane into the glottis, where the blades are to be separated by pressure on the projecting arms outside the skin. It presents an advantage in the absence of a large external wound or fistula, but the question of tolerance has yet to be determined. Should it prove feasible and practical it will, probably, prove more useful in croup than either tracheotomy or intubation.

A Tracheal Cannula for Patients with Goitre.—Fritz Salzer^{8 Oct. 18} describes and illustrates a comfortable cannula for patients with goitre, who often have reason to complain of the pressure produced by the ordinary cannula. In the absence of a cannula especially constructed for the purpose, he has used with entire satisfaction an extemporaneous contrivance made as follows: A hard-rubber tube of proper calibre and fifteen and one-half centimetres in length is bent nearly rectangularly at a distance of five centimetres from one extremity. This bent portion is intended for the trachea, and the horizontal arm for the track through the tissues in front of it.

The superior surface of this horizontal arm is to be pierced horizontally with a series of pairs of small holes eight millimetres apart. An ordinary cannula plate is passed over the outer extremity of the cannula and held in place with a safety-pin passed through one of the pairs of perforations at any point that may be desired, and its position is readily changed from time to time as tumefaction may require. The shape of the cannula is similar to that of the outer cannula of Durham, and the perforations and safety-pins represent the movable collar carrying the plate.

A new laryngeal forceps (Fig. 8) is described by Norris Wolfenden,¹¹ designed for operating upon a hard fibroma in the infraglottic portion of the anterior commissure. Two arms opening scissorwise are somewhat bent to keep the hand out of the line of vision. The upper arm is formed of two pieces joined by a slot

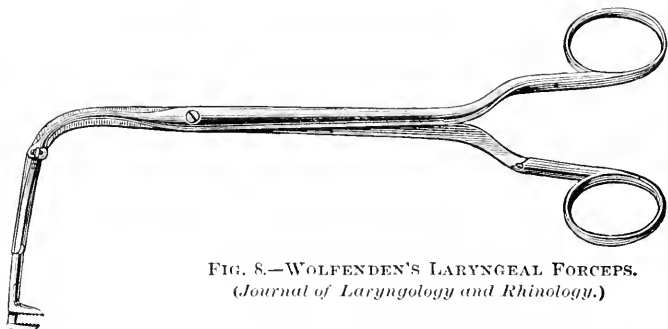


FIG. 8.—WOLFENDEN'S LARYNGEAL FORCEPS.
(*Journal of Laryngology and Rhinology.*)

and nut. The lower end carries the cutting edge, which works through a groove in the other arm. The cutting portions are formed of two pieces attached to the two arms respectively, and the blades cut from below upward, the upper edge slightly overlapping the lower one.

A new surgical electric lamp (Figs. 9 and 10) has been devised by Th. Stein,^{116 2} v. 2, No. 9; Nov. 17 *L* and *F* are two spectacle rings of vulcanite connected by an ivory isolating band, *b b*. These spectacle rings can, if necessary, be fitted with lenses to correct any abnormality of vision in the observer. The ivory band carries two small metal rods, *r* and *r'* (*r'* in Fig. 10), to which a light metal cylinder, *B*, containing a glow lamp, is attached; in front of the glow lamp is a hemispherical lense, *R C'*. Each of the spectacle rings carries a black cylinder of stiff cardboard, *a a'*, which shades the eye of the observer from the glares of the lamp and from ex-

traneous lights. The wires from the battery supplying the current are connected with the apparatus by the screws, *n m*. The spectacle ring *F* (Fig. 10) contains the two isolated wires, connected on

FIG. 9.

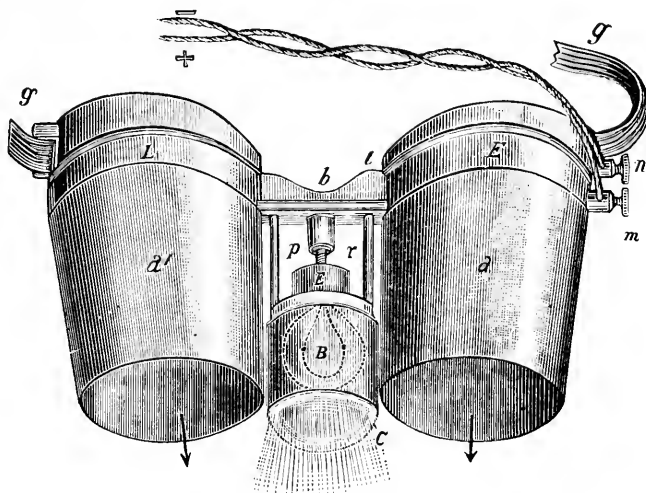
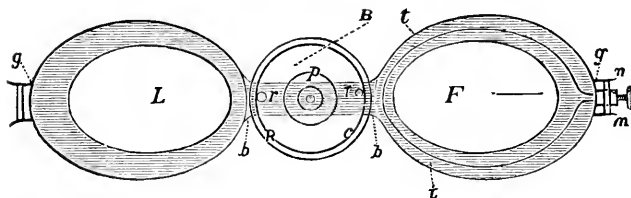


FIG. 10.



FIGS. 9 AND 10.—STEIN'S ELECTRIC LAMP.
(*British Medical Journal*.)

the one side with these screws, and on the other with the rod *r'* and with the knob *p*, and through these two connections with the glow lamp. The apparatus, as shown in Fig. 10, weighs forty-eight

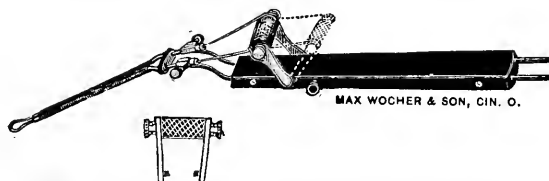


FIG. 11.—THORNER'S ELECTRIC CAUTERY HANDLE.
(*Medical Record*.)

grammes (about one and three-quarter ounces). It is adjusted in situation by the elastic band, *g g*. The size of the field of light can be altered by shifting the lens, *R C*.

An admirable and delicate electric cautery handle (Fig. 11) has been devised by Max Thorner, of Cincinnati.⁵⁹_{Oct.27} It has a lever attachment for the snare instead of a screw, thus reverting to the old principle of Voltolini's instruments.

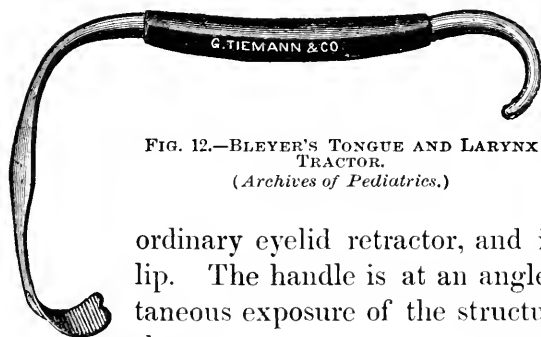
An ingenious aseptic spongeholder has been devised by F. C. Huson, of New York.⁵⁹_{Oct.27}

A tongue and larynx tractor (Fig. 12) is described by J.

Mount Bleyer, of New York,⁵¹_{Oct.} for depressing the tongue, and, at the same time, drawing the epiglottis forward. The tracting portion

FIG. 12.—BLEYER'S TONGUE AND LARYNX TRACTOR.

(Archives of Pediatrics.)



has the shape of the ordinary eyelid retractor, and is bent with a laryngeal lip. The handle is at an angle which favors the simultaneous exposure of the structures and operation upon them.

A modified mouth-gag upon the principle of Denhard's gag is described by the same author (Fig. 13). A wedge attachment has been made to the jaws of the gag, which are padded with rubber. The shoulders of the gag are very low, so that it will not press upon the hard palate. The arrangement of the angles of the

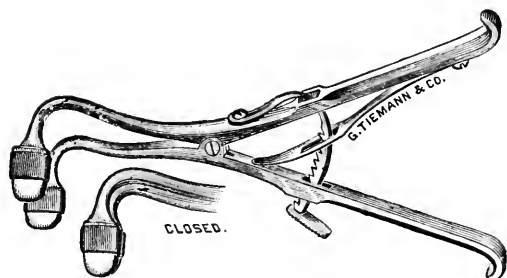


FIG. 13.—BLEYER'S MOUTH-GAG.

(Archives of Pediatrics.)



FIG. 14.—BLEYER'S INTUBATION TUBE.

(Archives of Pediatrics.)

gag prevents slipping. The separation of the jaws can be easily made to any degree. The instrument lies flat upon the cheek and is self-retaining. A cupped and false epiglottis tube, devised by the same author, Fig. 14. The cup is claimed to facilitate extraction, and the metal-hinged false epiglottis to prevent passage of liquids.

LEGAL MEDICINE.

By FRANK WINTHROP DRAPER, A.M., M.D.,

BOSTON.

MEDICAL RESPONSIBILITY.

In Puerperal Cases.—The Chicago Medico-Legal Society, at its meeting of March 3, 1888, discussed the question whether the failure of a physician to accept and practice the precepts of antiseptic midwifery should make him legally liable and responsible if puerperal fever developed in his puerperal patient during his attendance upon her. The discussion grew out of a paper by Dr. Etheridge, ⁶¹ May 5, 12, 26 in which he criticised unfavorably the advanced views of members of the Chicago Obstetrical Society, who insisted on the need of antiseptic precautions in the care of obstetric cases. He insisted that it was premature to adopt the germ theory in the etiology of puerperal fever, and that the dogmatic assertions of men in medical society discussions had a tendency, if published, to impose a too strict accountability on physicians. The general sentiment of those who took part in the discussion was not in sympathy with Dr. Etheridge's position. The prevailing opinion appeared to be expressed in the following remarks of Dr. Gapin: "The great discovery of antisepsis, or what we might call therapeutic cleanliness, has come to stay. . . . It will finally settle to what has taken place in other departments of the law, and what will be required of the practitioner in this respect will be the same that is required of him in surgery and the administration of medicines—ordinary care and diligence, and ordinary skill in view of the knowledge of the profession at or within a reasonable time of the date of the supposed injury. In medicine and surgery there is no ideal perfection and little that is absolutely sure, but . . . if called upon the witness-stand I should feel compelled to say that one who had been careless with regard to the cleanliness of his patient had not done his whole duty by that patient. I think that we should impress upon the profession at large the fact that sooner

or later they will find this responsibility placed upon them, and that it may assume a financial aspect."

With reference to this question Fritsch^{69 61}_{No. 12, May 26} has some excellent observations concerning the nature of the evidence required in any given case. He writes: "A question that the judge addresses to the expert is the following: Do the operations or the omissions of the accoucheur stand in a causal relation to the death of this puerpera? This question cannot be answered simply by 'Yes' or 'No.' At most only the scientific conviction can be expressed that a causal relation is probable. But the expert is never in a position to swear that except for the operations or the omissions of the attending physician the life of the puerpera would without doubt have been preserved. Fatal peritonitis may occur in consequence of the rupture of a pyosalpinx during the course of an otherwise normal labor; the possibility of purely accidental infection, in which the attendant plays no part, must be admitted. The method of the infection must be clearly established before the relation of cause and effect can be looked upon as clearly demonstrated. To establish this three data are to be supplied: (1) the source of the material of infection must be made clear; (2) the omission of disinfection must be demonstrated; (3) any cause of death other than the puerperal disease must be eliminated. In establishing the first point, it is not necessary to demonstrate infection with puerperal poison only. A midwife was convicted who was suffering from an inflammation of the lachrymal sac. It was shown that, contrary to the physician's orders, she had attended women in labor without disinfection of her hands, and that during the confinements she had compressed the tear-sac with her fingers, and immediately afterward introduced them into the parturient canal. American readers will recall the sad case of Dr. Rutter and his ozæna. The omission of disinfection is not difficult to determine. In case of alleged disinfection, the fact of such preparation at the bedside must be attested by competent witnesses. The third point is elicited from the history of the case, the observation of the course of the disease, and the results of the autopsy. In the concrete case of fatal puerperal fever, therefore, when the source of infection, the omission of disinfection, and the absence of any other cause of death than puerperal fever have been demonstrated, it is consistent with all the facts that there is a

causal relation between the operations or the omissions of the accoucheur and death of the puerpera."

Brouardel, in a lecture ²⁴⁶_{July 15} on medical responsibility, took quite conservative ground on this subject. He said: "If one is summoned to testify as an expert in a case where the question relates to infectious accidents, he should remember that the antiseptic method of treatment is very recent, and that, indeed, a large class of medical practitioners has been so long graduated that their education would be unequal to the practical details of antisepsis."

In Insanity Cases.—Two cases have occurred within the past year which illustrate anew the risks run by medical men in signing certificates of insanity in good faith and with a due sense of responsibility. Two physicians of Albany, N. Y., Drs. Russell and O'Leary, acting under the order of a county judge, examined a lunatic, and upon their certificate of his insanity and need of hospital treatment he was committed to an asylum. Five days later the patient appealed to the courts and petitioned that the question of his mental condition might be referred to a jury for determination. The jury returned a verdict that the petitioner was sane, and he was then set at liberty. Thereupon he brought suit against the physicians and the judge who had committed him on their certificate, claiming damages for false imprisonment. The Supreme Court, however, disallowed the claim and sustained the demurrer of the physicians. In the decision reported are the following sentences, ²⁷⁸_{Apr.} which set forth clearly the law in such cases:—

"The complaint does not charge the defendants, Russell and O'Leary, with any active participation in the arrest and confinement of the plaintiff; it only charges them with making the certificates without due care. . . . The law does not prescribe the extent of the examination and inquiry that is to be made by the physicians, nor the nature of the proof to be relied on by them. All they are required by law to do is to make their certificate after a personal examination by them of the party alleged to be insane. This the complaint alleges that they did. After such examination they certified that in their opinion the plaintiff was insane. In the absence of malice, which is not alleged, and acting in a quasi-judicial capacity, in which they were called upon to judge and determine, as well as to certify their opinion, as to the mental condition of the plaintiff, it is not perceived how they

could be made liable for false imprisonment, for the arrest and detention of the plaintiff by an officer or keeper of the insane, even if he acted on the statement made in such certificate. . . . The proceeding to determine whether or not the plaintiff was a lunatic is a judicial proceeding, and the certificates made in the regular and orderly course of this proceeding are privileged, as in other cases of evidence or testimony taken in a judicial proceeding."

Another somewhat similar instance¹⁶⁶_{July} occurred in England. A lady of good social position, presenting unequivocal signs of acute mental disorder, with dangerous suicidal tendencies, was examined by two physicians, and upon their certificates of her insanity, given gratuitously, was sent to an asylum; she had about four years of hospital treatment. When discharged, she entered a suit against the two doctors and the lady superior of the convent from which she was removed to the asylum, her claim being that the three had maliciously conspired to immure her in an insane asylum when she was not insane, and that the medical certificates were insufficient and had been made without due care and skill.

The charge of conspiracy was abandoned so far as it related to the medical men, and the issue so far as it concerned them had reference only to their negligence. The insanity of the plaintiff was clearly proven. The judge in summing up the case for the jury said that if it were to come to this, that respectable medical men were to be deterred from signing insanity certificates through apprehension of such legal proceedings as those then pending, it would be a most unfortunate thing for the patients themselves. No physician was bound to sign a certificate in any case, but if he acted at all he undertook a duty and was responsible for any breach of it. In this case the claim was that the doctors' inquiry and investigation were insufficient, but the only evidence of negligence was the plaintiff's own account of her interviews with the physicians. The jury rendered a verdict favorable to the defendants on all the points presented to them by the judge and taxed the costs upon the plaintiff.

INSANITY IN ITS RELATIONS TO CRIME.

Legal traditions and precedents are slow to yield to the influences of enlightened progress in medical science. For forty-five

years juries in capital cases in Europe and America have been instructed by judges that they must apply the old McNaughten test of a knowledge of right and wrong to determine the question of responsibility in cases in which a defendant pleads insanity as an excuse for homicidal violence, and so strongly has this inhuman and illogical dogma become intrenched that judges seem unable or unwilling to disavow it, either wholly or in part, and to recognize the help which modern psychology offers toward the settlement of the problem. When, therefore, individual representatives of the judiciary step out of the old and well-worn path and expound from the bench new and better views of the relation of insanity to crime, it marks a genuine medico-legal epoch. One such instance has occurred within the past year, and Judge Montgomery's charge²¹⁰_{Sept} to the jury in this case was such a distinct step in advance of the prevailing judicial ideas relating to insanity that it merits special attention. One John Daley was on trial before the Supreme Court of the District of Columbia for the murder of a man named Kennedy. There was no question as to the material facts; the issue lay in the question whether the accused was insane and irresponsible at the time he committed the crime. Upon this question Judge Montgomery charged the jury as follows:—

“In considering this case, and the defenses which have been presented, the jury should consider the following questions:—

“1. Was the defendant at the time of the act, as a matter of fact, afflicted with disease of the mind; was he wholly or partially insane?

“2. If he was so afflicted, did he know right from wrong, as applied to the homicide in question?

“If he did have such knowledge, had he, by reason of the duress of such mental disease, so far lost the power to choose between right and wrong and to avoid doing the act in question as that his free agency was destroyed at that time; and, if so, was the homicide so connected with such mental disease, in the relation of cause and effect, as to have been the product of it (the mental disease) solely? If you are satisfied that the defendant was mentally afflicted so that he did not know right from wrong as applied to this act; or, if he did know, but by reason of the duress, the stress of his mental disease (if he had any) he had no power to choose, no power to avoid doing what he did, and if the homicide

was the product of his mental condition solely; or if, by reason of the insane delusions which the defendant had been harboring, he had reached that condition of mind where the morbid impulse to kill became irresistible, and existed in such violence as to subjugate his intellect, control his will, and render it impossible for him to do otherwise than to yield and do as he did, then he is not to be held accountable.

“If some controlling mental disease was, in truth, the acting power within him, which he could not resist, then he will not be held responsible.

“If a person commits a homicide under the influence of an unaccountable and irresistible impulse, arising not from natural passion but from an insane condition of the mind, he is not criminally responsible.”

Undoubtedly the principles here enunciated are in accord with the views held by the better class of alienists everywhere. Many quotations might be made from the recent writings of authorities in mental disease to illustrate this. A single example will suffice. Sir J. Crichton Browne, ⁶July 28, Aug. 4 in an address on responsibility and disease, made the following among other sensible observations:—

“Could he or she help it? That is the real practical question at issue in every case in which the defense of insanity is set up. Was the lunatic free to choose, or under the duress of disease? Was his will capable or inept? Lord Bramwell and those who think with him argue that it is sufficiently proved that the lunatic could help it if he knew the nature of his act—that it was killing; the quality of his act—that it was a crime; and also that it was wrong in the sense of being forbidden by the law. Whereas medical men, almost without exception, maintain that a lunatic may be able to know and express the nature and quality of an act and its wrongness, and yet be as unable to resist doing it as he is to abstain from jumping under a smart electric shock; and that knowledge of the nature and quality of an act and its wrongness is not in the regions of pathology any measure of will-power. . . . Impairment of will, or loss of self-control, more or less pronounced, is, according to medical men, the first, last, and universal element in insanity, and ranges from a trifling reduction in the check-action which we exercise on the ordinary currents of thought and feeling down to paralysis of the sphincters.”

RAILROAD ACCIDENT NEUROSES.

The frequency with which claims for damages growing out of railway casualties become a subject of litigation, the large amount of money involved, and the diversity of the views of experts, in and out of court, make valuable the publication of new and authoritative observations on these cases. Oppenheim^{4 16}_{No. 9, Oct.} would substitute for the term "railway spine" of the earlier writers on the subject, and for the more recent coinage, "railway brain," the diagnostic expression, "traumatic neuro-psychosis," as at once broader and more correct than any other. In his belief the brain shares with the spinal cord the effects of the injury received. The symptoms, indeed, are chiefly psychic, suggesting hysteria; mental depression and anxiety, irritability, vertigo, hyperæsthesia and anæsthesia in juxtaposition, extreme sensitiveness to light, are common. Pains of a dull character, especially about the head, muscular tremor, swaying on closure of the eyes, are often present. The girdle sensation is rare; reflex excitability is more often lessened than increased; the tendons always react. The patient moves slowly, with a peculiar gait, unlike that of hemiplegia. The pulse is quickened and there is palpitation.

It cannot be denied that mere fright, "psychic shock," has set up the various psychoses in many cases. And there are undoubted observations of disseminated sclerosis due to shock. On the other hand, the bodily shaking must go for something in the causation of the symptoms.

It is consistent with Oppenheim's view of railway accident cases that they always grow worse while any legal suits are pending, but improve to a certain extent at once when these are ended, although Rigler argued that this was a proof of simulation. We cannot wonder that anxiety about the means of living and fear of want and degradation act detrimentally on such morbid psychic conditions. Even when substantial damages were awarded, the cases which the author was able to follow never fully recovered. The prognosis, so far as recovery is concerned, is unfavorable. Most of the author's patients were in hospital under long observation, and very few were previously "nervous." Alcoholic subjects may be difficult to diagnosticate, because alcohol may profoundly disturb the nervous system.

Long observation of railway cases, preferably in hospital, is

necessary before a sound judgment can be made and simulation eliminated, but the author states that in the cases he has been able to follow up he has never been deceived on this point. Finally, the symptoms enumerated above have been repeatedly observed after other than railway accidents when compensation was not in the question.

Vibert¹⁰²⁶_{p.118, '88} has devoted an entire volume to the subject of lesions produced by railway accidents. He attaches considerable importance to the effect of the *ébranlement*, or general vibration, to which the body is subjected at the moment of the collision, and shares with many contemporary surgeons and neurologists the belief that it is to this peculiar incident of railway casualties that the many obscure and anomalous symptoms are due.

But among the subjects of accidents which Vibert observed, the mental and purely subjective symptoms never attained a high degree of gravity without the coincident presence of other symptoms, objective in character, disorders of the general health, quite easy to diagnosticate. (For further information see next department, and Department B, vol. ii.)

THE MICROSCOPIC DIAGNOSIS OF BLOOD-STAINS.

The most important recent contribution to the literature of the microscopy of blood is a monograph¹⁰²⁷ by Formad. The author presents an exhaustive treatise upon the subject, embracing its historical relations as well as a review of the most modern observations. After a concise description of the physical, morphological, and chemical characteristics of blood, the work is devoted in its main portion to the one important medico-legal question, the diagnosis of human blood and that of animals. The author is an enthusiastic believer in the microscope. With unequivocal reliance on his position, he places himself in the ranks of those who are "positive" in their belief that micrometry of the blood-corpuscles is a reliable method of determining the human origin of suspected stains, if the condition of the specimen is such as to render measurement of the elements practicable. He does not propose any original methods of technical manipulation, but finds that he obtains satisfactory results from procedures already well understood by microscopic experts. He uses an instrument with an immersion lens giving a magnifying power of one thousand diame-

ters. It is to his credit that he does not bring forward a new fluid reagent to restore altered corpuscles; in his hands Müller's solution of bichromate of potassium or Virchow's 30 per cent. solution of caustic potash suffices to accomplish the desired end. He writes with great confidence of his ability to obtain satisfactory conclusions with even old stains in many cases, and has a word of disfavor for "high authorities in medical jurisprudence" who state that "the difference between the red corpuscles of man and other animals is too minute to render their positive discrimination possible, and too insignificant to admit of its being used as a means of condemning a fellow-creature to death;" he remarks that it must be remembered that "these gentlemen did not measure any corpuscles themselves, and relied altogether upon authorities, who denied the reliability of micrometry of blood-corpuscles." And of others, like Virchow, who deny our ability of diagnosing human blood in *dry* stains, he hints that it is to be hoped that they have changed their opinion since they wrote on the subject several years ago.

The work is embellished with some very attractive illustrations of micro-photography, and the section on the amplification of photographs of corpuscles to ten thousand diameters is particularly interesting. The monograph is full of interest to the student of legal medicine, whether he finds himself in harmony with the writer's very positive and advanced views, or dissents therefrom in greater or less degree.

Professor Gage¹_{Aug. 11} draws attention to the resemblances and contrasts which the red blood-corpuscles of lamprey eels show when studied alongside those of the human subject. "As the red blood-corpuscles of the *Camelidae*," he remarks, "form an exception in the great mammalian group in being oval instead of circular in outline, and, according to Gulliver, in not forming rouleaux, so the red corpuscles of the lamprey eels form an exception in the great non-mammalian group of vertebrates in being biconcave and circular in outline, instead of being oval and biconvex, like those of birds, reptiles, and fishes. The corpuscles are like those of mammals also in forming distinct rouleaux; this is especially marked in the brook lamprey and in the larvæ. The nucleus is present in all the corpuscles, but as it is placed in the thickest part of the corpuscle it does not show in perfectly fresh specimens, except faintly in those of the embryo. The

corpuscles when fresh appear, therefore, exactly like human corpuscles.

“As eels are often caught for food, and the larvæ are used for bait, fishermen are liable to have upon their clothing and implements fresh blood-stains; and if a crime were committed the question might arise whether these were from a human being. No difficulty should arise in deciding the question, for (*a*) the presence of a nucleus may be readily demonstrated, as it is made apparent by drying, by acetic acid, and by the reagents most used in examining blood for medico-legal purposes; (*b*) except in the embryo nine to ten millimetres long, which would never be used for bait, the corpuscles are nearly twice as large as those of man. Hence, the blood-corpuscles of lamprey eels, in spite of their biconcave form and circular outline, really offer no more difficulty in medical jurisprudence than the corpuscles of any other of the non-mammalian vertebrates.”

THE CAUSES OF SUDDEN DEATH.

Lesser³¹¹_{Jan.} has reported the facts relating to one hundred and seventy-one sudden deaths which came under his medico-legal investigation in Berlin and Breslau. Of these cases, one hundred and twelve were males and fifty-nine were females. In one hundred and sixty-two instances disease was the cause of death; in nine death resulted from the inhalation of foreign bodies into the trachea or bronchi. In fifty-three cases only did the autopsy determine the cause of the suddenness of the death; in the remaining one hundred and nine no definite reason for sudden death was ascertained, although in many instances structural changes were observed. In sixty cases death was instantaneous; in forty-six within a few minutes; in ten death was delayed beyond ten minutes after the primary symptoms; and in forty-six the bodies were found without any history.

The cases in which the autopsy demonstrated the cause of a sudden death were as follow:—

Cerebral hæmorrhage,	21
Rupture of an aneurism,	9
Accidental suffocation,	8
Rupture of the envelopes of an extra-uterine pregnancy, . .	4
Hæmorrhage from various sources,	5
Pulmonary embolism,	6

The remaining one hundred and nine cases were found to have causes as follow:—

Epilepsy,	17
Heart-disease,	71
Brain-tumors,	2
Pneumonia,	9
Phthisis,	2
Edema of the glottis,	4
Perforating peritonitis,	2
Hydrothorax,	1
Delirium tremens, with hæmorrhage into the pancreas,	1

Lesser comments on the absence of convulsions in the cases of suffocation observed by him, and also on the almost instantaneous occurrence of insensibility and death under such conditions.

JUDICIAL INVESTIGATION OF DEATHS BY VIOLENCE.

The venerable, but clumsy and expensive, coroner's method of determining the cause, manner, and accountability of deaths supposed to be due to violence yields slowly and reluctantly before the advance of enlightened ideas and knowledge of its general inefficiency. In three of the thirty-eight United States (Massachusetts, Connecticut, and Rhode Island) the coroner system has been either abolished or greatly modified in favor of a new and more rational way, and the success which has followed the innovation has begun to be recognized. A committee of the American Medical Association, appointed to consider the whole subject of the coroner system and its administration, commends for earnest consideration the following propositions:—

1. To abolish the office of coroner.
2. To dispense with jury service.
3. To separate the medical from the legal duties in all cases involving the examination into the causes of death where crime is suspected.
4. To intrust the medical examination only to competent medical officers properly trained in their work.
5. To make the number of these medical officers as small as is consistent with the proper discharge of their duties.
6. To consign all questions of law only to properly qualified legal magistrates.
7. To remove the appointment of these officers entirely from

the question of political consideration, and base it only upon their possession of the requisite and proper qualifications.

Upon some basis of this character should the coroner's law be revised. Much useless expenditure of time and money would be avoided; often great sorrow and anxiety would be prevented, and, that which is of vastly greater importance, the ends of justice would be far better served.

Eaton²⁶_{July 2} contributes a very exhaustive paper on the coroner and his duties as they exist in England. He commends the Massachusetts system of investigating obscure or suspicious deaths, and urges that only medical men should be appointed coroners, or, at least, that no inquest should be held until a medical man had reported the necessity for it; and that if legal practitioners are to be retained as coroners, in every case the coroner ought to be guided as to the necessity for holding an inquest by the opinion of a regularly appointed medical officer as assessor.

JUDICIAL EXECUTIONS.

Considerable attention has been given during the past year to the discussion anew of an old subject, namely, the proper method of taking human life in execution of judicial sentence in capital cases. The expediency and propriety of abolishing capital punishment altogether has not engaged medical thought very generally; but, the desirability of continuing this kind of penal treatment as a deterrent measure being accepted, medical jurists have devoted themselves somewhat to a new study of the best methods to be employed.

Thus, Marshall²_{Oct. 6} has devised an apparatus which shall make hanging a more successful and satisfactory proceeding than it sometimes is. His apparatus consists of a metallic chin-guard, at the front of which, inferiorly, is a strong eye of iron of the shape of a row-lock; this guard is adjusted to the chin of the culprit and the rope passes through the eye beneath the tip of the chin and then around the neck. The purpose of this arrangement is to secure and maintain a strictly submental position of the knot and thus, with a short drop, to throw the head backward so suddenly and to such an angle as to dislocate the neck and produce instant loss of consciousness and painless death, without danger of decapitation. The device was not received with favor

by a committee of the British Home Office appointed to consider the subject of capital punishment.

The guillotine method of judicial execution has also been a subject of special study recently, and a volume of nearly three hundred pages attests the zeal and exhaustiveness with which the French student treats any subject, however grim it may be. Loye¹⁰²⁸ asks these questions and devotes much space to their answer: "Does decapitation result in immediate abolition of consciousness? Can the head, suddenly severed from the body, still think, still will, still suffer? Does the unhappy culprit, who pays his debt to justice, feel the horrible wound made by the blade of the executioner?" Numerous experiments upon dogs have demonstrated to the author that the mechanism of death by decapitation is divisible in these subjects into two distinct elements, namely: rapid asphyxia and more or less complete nervous inhibition; decapitation of these animals is accordingly attended by phenomena which illustrate these stages, there being, during an interval of about two minutes, movements of the facial muscles and agitation of the entire trunk. In the human subject, however, the phenomena are different; the severed head remains motionless and the countenance is impassive; death is by nervous inhibition and not by asphyxia, the shock produced by the passage of the knife through the tissues of the neck being so sudden and thorough as to preclude the development of the symptoms of respiratory embarrassment and to bring about instant death without pain. The advantages which Loye finds in the guillotine over other forms of judicial execution are that it produces immediate suspension of mental action; that there is no chance for resuscitation or for restoration of consciousness, however brief; that there is no sense of pain, and that it fulfills the requirement of the law that the death shall be certain and without unnecessary distress to the condemned person. The kind of capital punishment which satisfies the needs of society ought to offer two guarantees: one, that the death of the brain, the annihilation of consciousness, shall be immediate; the other, that this result shall be final and irrevocable. Both of these guarantees the guillotine gives. The mutilation of the body and the bloody spectacle of the execution are regarded by Loye as unimportant incidents of the affair.

While attention has thus been given in other countries to

improving and justifying old and tried methods of capital punishment, American medical jurists have shown much interest in the introduction of a real innovation in this matter. Influenced largely by the emphatic representations of the Medico-Legal Society, of New York, legislation was accomplished early in the year which revolutionized the method and attendant proceedings of judicial executions in that State. At the beginning of the present year (1889) the law required that criminals under sentence of death should be deprived of the sensational and demoralizing attentions of outside sympathizers; that their death should be accomplished in private, with only a few necessary witnesses, and that, instead of the rope, the electric current should be the means employed.

But the substitution of death by electricity for death by hanging does not meet with unanimous approval. On the side of sentiment, there are protests not a few; while scientific as well as practical men prophesy that it will not be easy to carry the scheme into execution as a certain and satisfactory method of capital punishment. Hammond has declared himself in favor of the superiority of hanging as the mode, and has maintained that it is practically painless. If a criminal with a rope properly adjusted around his neck were simply drawn up by means of a pulley, so that his feet were prevented from sustaining his body, his death would follow painlessly in seven or eight minutes. B. W. Richardson, of London, criticises the change ³⁸ June with much emphasis. He writes: "In disgust at the foolish barbarism of the time, which keeps up the crime of capital murder, the humanitarian fraternity, afraid to support the sound and logical policy of abolition of the extreme offense, tries to dally with reason and conscience by the attempt to divest execution of all pain and terrors. Euthanasia for the worst of criminals, by the side of so-called natural but often most cruel death for the rest of mankind, is practically the proposition—a proposition which carries with it its own condemnation."

He then proceeds to express a belief similar to that of Hammond, that death by strangulation or suspension is practically painless, so that the "process of hanging looks brutal without being so." But he brings a more important charge against the new method. In some experiments on the application of the electric current for the painless extinction of the lives of animals to be used as food, this mode of death was found to be very uncer-

tain. Sheep stricken into apparently instant and absolute death by electricity, after a few minutes showed signs of life and were dispatched in the ordinary way by the knife. A large dog, perfectly unconscious and to all appearance dead from the stroke of a powerful battery, was subjected to a surgical operation during this unconsciousness, and afterward made a full and easy recovery. In most cases the electric shock will kill at once, especially if the alternating current be used; but exceptionally it will simply stun, and may induce the semblance of death without the real event. Richardson thinks that it will be real humanity to supplement death by electricity by a post-mortem examination of the victim, so that the execution may not be consummated by an unintended burial alive.

The advocates of the new method have the duty laid upon them to confound their critics by a demonstration at the first opportunity; and it is to be hoped, in the interest of good morals, that the first experiment of the kind may not prove to be a fiasco, or, if so, that its subject may be a person upon whom pity would be wasted. It does not appear that condemned murderers have, as yet, had a chance to express their preference, if they have any, for the mode in which they shall expiate their crime.

In this connection it is interesting to note the variety of methods employed by modern civilization to dispose of malefactors convicted of capital offenses. Of the thirty-six European States, ten make use of the guillotine, nineteen the sword, three the gallows, two use fire-arms, one employs the garrote, and one beheads with the axe.

DEATH BY DROWNING.

Brouardel and Loye⁵_{Apr. 4} submitted to the "French Association for the Advancement of the Sciences" some new observations concerning the mechanism of death by drowning. They remark that the interval of resistance to respiration which follows the single deep inspiration of surprise has been considered by some physiologists as under the control of the will; that a dog, for example, closed the glottis to prevent the intrusion of the water. This is not the correct view, however, for the same period of resistance is to be observed in dogs after the operation of tracheotomy and while under the effects of chloroform. There is an expiratory force of

the lung which is under the influence of the superior laryngeal nerve and depends upon irritation of that nerve. In drowning, it is the contact of the water with the mucous membrane of the larynx which determines this action of the nerve.

A submersion of four minutes is required to make death certain; but it is in the first ten seconds that the greatest quantity of the liquid penetrates into the lung. This fact is somewhat surprising when one recalls that, in most instances, an animal submerged for the space of one minute may be resuscitated; while after a longer submersion, although the amount of water in the lungs is not materially increased, restoration to life is not generally accomplished.

The water that enters the lungs is absorbed and penetrates into the blood to dilute it, this effect following not only before death but also after the last respiratory act, a fact of prime importance in legal medicine. The medical jurist is often called upon to determine whether an individual has been drowned or if the body found has been thrown dead into the water. Now, since according to past teaching, the blood of a drowned person is liquid and not coagulated, one would conclude, if he found the blood fluid, that it was a case of drowning. But this teaching should be modified if, as these authors claim, water enters the blood after the last act of respiration. Besides, they tell us that even in a drowned person the blood is found coagulated if the examination is made within a short time after the death. Furthermore, it is found liquid in the right cavities of the heart and in the great vessels but it is in a coagulated state elsewhere. Fluid blood may be found in the thoracic vena cava and clots in the abdominal vena cava. The authors have never found the portal vein containing fluid blood but always a very solid clot.

Water in the Stomach in its Relation to Death by Drowning.

—Obolonsky³¹¹ ⁵ reports the results of some experiments made by him with dead bodies to determine whether water found in the stomach after death, if identical with that in which the person was drowned, is to be regarded as one of the proofs of drowning, as has been taught. His conclusion is that water can enter the stomach after death, and therefore that its presence there is not of value as a sign of drowning. He placed dead bodies of infants, eighteen in number, in a large vessel of colored water, sinking them by means

of attached weights, and observed by dissection afterward whether water had penetrated into the stomach. The bodies remained in the water during periods varying from twenty-four hours to three days. No water was found to have entered the stomach during twenty-four hours' submersion; but in five of the bodies submerged for three days water had entered the stomach. In three of these a notably large quantity of water was found; in the remaining two there was a small quantity only.

DEATH BY HANGING.

Surgeon-Major Mackenzie,²⁰⁶_{Oct.} of Calcutta, reports notes of one hundred and thirty suicides by hanging; they were equally divided between the two sexes. Unfortunately, a complete inspection with full notes was not made in every case, and the analysis thus loses somewhat in value.

Of 81 cases observed, the tongue was found protruded in 41.

16	"	"	the tongue was found protruded in 16.
40	"	"	the eyes were protruded in 15.
21	"	"	there was frothy mucus at the mouth and nostrils in 20.
92	"	"	there were vaginal or urethral discharges in 30.
8	"	"	the penis was found erect in 3.
93	"	"	the hyoid bone was fractured in 24.
64	"	"	the thyroid cartilage was fractured in none.
11	"	"	the cricoid cartilage was fractured in none.
77	"	"	the vertebrae were fractured or dislocated in none.
90	"	"	the coats of the carotids were ruptured in 31.
71	"	"	the mucous membrane of the air-passages was congested in 56.
130	"	"	asphyxia was the cause of death in 119.

In the cases in which a rope was used the mark on the neck was well defined, indented, and parchment-like, while in the cases in which cloth ligatures were used the marks were faint, of a reddish color, and not desiccated, except in places where the cloth was twisted and where the pressure was great.

In not one of the one hundred and thirty cases were the muscles of the neck, the larynx, trachea, or large bronchi injured, and in none of them was there any extravasation beneath the skin of the neck.

Coutagne⁵⁵_{Jan. 25} gives details of twenty-four cases of suicidal hanging, and insists on the need of a careful examination and dissection of the neck, or a complete autopsy; in other words, as the essential thing in establishing a diagnosis of death by suspension. In the twenty-four cases investigated by the author five gave negative

results upon a dissection of the neck. In the nineteen other cases he found in seventeen instances hæmorrhages into the cellular tissue or into the muscles; in ten, rupture of the muscular fibres; in eight, fracture of the hyoid bone; in eight, fracture of the thyroid cartilage. Rupture of the carotids was found to be more limited and in less close relation to the situation of the cord than other writers have indicated. The lungs of those dead by hanging presented to Coutagne a special aspect, which he describes under the term “œdème carminé;” he believes that the change depends on injury to the pneumogastric nerves, an opinion which he thinks he has confirmed experimentally.

In contrast with these effects of hanging when the suspension was suicidal, the following summary of eight cases of judicial hanging observed by Chuckerbutter²⁰⁶ are instructive. He invariably observed that there were no movements of the body, limbs, or respiratory muscles after the fall in those cases where were fractures of the axis, either of its odontoid process or of its arch at its junction with the body. The death was instantaneous, without any struggle whatever in these instances. Where there were no fractures of the axis, the death was always due to apnœa, with accompanying struggles for two or three minutes.

The following table gives the essential facts of this interesting series in a form for ready study:—

No.	Emission of Semen.	Height of the Fall.	Effect on the Axis.	Effect on the Spinal Cord.	Mode of Death.
1	Yes.	7½ feet.	Fractured.	Lacerated.	Instantaneous.
2	“	8 “	Fractured.	Lacerated.	Instantaneous.
3	“	7½ “	Odontoid broken.	Bruised.	Instantaneous.
4	“	8 “	No fracture.	Uninjured.	Apnœa—struggles for 2½ minutes.
5	“	8 “	No fracture.	Uninjured.	Apnœa—struggles for 4 minutes.
6	“	7 “	No fracture.	Uninjured.	Apnœa—struggles for 3 minutes.
7	“	8 “	No fracture.	Uninjured.	Apnœa—struggles for 2½ minutes.
8	“	7½ “	Odontoid fractured.	Lacerated.	Instantaneous.

SIGNS OF RECENT DELIVERY.

Brouardel¹⁰⁰_{Dec. 22, '87} states that the discovery of a placenta may have important relations as evidence of the date of a recent delivery and of the stage of utero-gestation at which the delivery occurred.

A mature placenta measures fifteen or sixteen centimetres in diameter and weighs from five to six hundred grammes. It loses weight in proportion to the advance of decomposition; in winter it loses a third of its weight in ten days, and a half in eighteen days; this loss is, due to evaporation.

Among the evidences of recent delivery furnished by the lying-in room, Brouardel mentions spots of blood from the mother and of meconium from the child. Blood-stains should be submitted to the usual microscopic and spectroscopic examination. Concerning meconium, it is not easy to be deceived; it shows under the microscope small concretions of matter colored with biliverdine, with rectangular crystals of transparent cholesterine and epithelial cells from the intestine. The addition of nitric acid gives to the biliverdine a violet color. Moreover, the absence of the *débris* of muscular and vegetable fibres, such as are found in fecal matter, would be a valuable negative sign.

Brouardel believes that the proofs of delivery found on an examination of the woman are of short duration. As early as the tenth or twelfth day of puerperal convalescence, it is difficult to fix the date of the confinement. After six weeks one can say nothing positive; the uterus has then resumed its normal dimensions. The evidence afforded by a microscopical examination of the milk is uncertain and unsatisfactory.

There are no positive data by which to answer the question whether a woman has had one or several children.

The author asks the query: "Can a woman be delivered without her knowledge during her natural sleep? And he answers it in the affirmative, citing several authentic cases as proof.

Truman⁶_{Sept. 1} has made some observations which must modify the usual teaching relative to the value of colostrum corpuscles as a proof of recent delivery, and which are in harmony with Brouardel's statement above quoted. He examined twenty-three specimens of milk from women suckling infants and from women who had long since ceased nursing. In six cases, suckling at or about three months, the colostrum corpuscles were absent; they were absent also in three cases suckling from ten to twelve months and in one three weeks after premature delivery at four months. On the other hand, Truman found the corpuscles in milk from the breast of a woman five months advanced in her first pregnancy;

in that of another, a week after premature labor, at six and a half months; in that of another, four months after labor, at term; in three at twenty-six, twenty-three, and forty-eight months after confinement (ten months, eleven months, and three and a quarter years after weaning). Again, he found them in milk from a breast that had not been suckled in a woman a year after her confinement; in another woman. after the menopause; and in another case where there had never been a pregnancy. It is evident, therefore, that the colostrum corpuscle is an unreliable proof of recent pregnancy and delivery.

RAPE.

The Gonococcus in its Medico-legal Relations.—Aubert ²¹¹_{Feb. 12} states his belief that although one in ordinary practice may diagnose and treat successfully a case of gonorrhœa without the aid of the microscope, yet in legal medicine, in cases of rape or indecent assault, where the honor and the liberty of an accused person are in question, every exact method of diagnosis should be used, and hence a search for the gonococcus in a suspicious purulent discharge from the genitals should be made in every judicial inquiry of this class. His method of procedure is simple. He places a drop of the pus upon a glass slide, spreads it very thinly with another slide, and allows it to dry. He then stains the preparation with an alcoholic solution of methyl violet diluted with water; after a few seconds of exposure he washes the specimen with water, leaving it a little moist, places a thin cover-glass upon it, and it is ready for the microscope. The essential characteristic of the gonococcus is its granular appearance; a collection of the stained granules is seen, scattered or grouped, either within or outside the pus-cells.

Aubert summarizes his conclusions thus:—

1. The gonococcus should be considered as characteristic of blenorrhagic pus, and search for it should always be made when it is of serious consequence to make an accurate diagnosis.

2. The grouping of the micro-organisms in the protoplasm of the pus-cells and around the nuclei is alone to be accepted as characteristic. A single well-defined cell may be sufficient, but full dependence cannot be placed upon cocci, scattered or in groups, outside the cells.

3. The result of a search for the gonococcus should not be depended on except when the pus is obtained directly from the secreting service and immediately spread out and dried. The staining and examination may then be made at leisure.

4. It is at present impossible to decide positively as to the presence or absence of gonococci from the examination of dried purulent discharges on linen, because of the disintegration of the pus-corpuscles and of the want of characteristic grouping of the microbes.

5. One should not, at present, place too much confidence in the cultures made from linen stained for some time with dried gonorrhœal pus.

6. The many sources of accidental contagion should not be forgotten ; therefore, although the presence of gonorrhœa may be determined in a given case, its source, especially in the case of little girls, should be made a matter of independent proof at the judicial inquiry.

The Unruptured Hymen as a Proof of Virginity.—Professor Kinkead, ¹⁶_{June} in a communication to the Royal Academy of Medicine in Ireland, urged that it was an erroneous doctrine, which was sometimes accepted in court, that considerable weight could be given to the presence of the hymen as a proof of virginity. One might find the hymen absolutely untorn and its edges perfect, and yet the woman unchaste. On the other hand, one might find a torn hymen in a woman who was perfectly chaste and a virgin, the injury being accidental. In illustration of his position he cited a case under his observation of a prostitute, twenty-four years old, suffering from secondary syphilis and gonorrhœa, on whom he found a perfect hymen of normal size, shape, and consistency, its edges sharp and perfect, without a single rent. She had been a prostitute seven years, and her retained hymen was probably due to the deep-seated position of the ostium vaginae, the arch of the pubes being of a masculine type. In another case an unmarried woman, three and a half months pregnant, presented herself with virginal external genitals, the hymen perfect, its edges sharp and untorn. In a third instance parturition at full term was obstructed by the persistence of the hymen stretched tightly across the opening of the vagina, and showing an aperture no larger than a crow-quill ; this membrane having been divided, the

labor was readily concluded. In a fourth case a first pregnancy had proceeded to its maturity in a woman of forty years, and the hymen remained intact; what is still more extraordinary, it was so voluminous and elastic, and its situation was so favorable, that the child was delivered with the forceps without injuring it.

Atthill, commenting on these cases, said that the term virginity, both with medical men and the public, ordinarily meant that there had been no sexual intercourse; and looking at the existence of the hymen as a test of virginity, from that point of view, he was perfectly satisfied that intercourse might take place without so much as a slight cracking of the hymen. In certain cases the hymen yielded, like a piece of India rubber, to gentle pressure, without rupture, and afterward regained its previous condition, and was only torn by parturition.

EXAMINATION FOR LIFE INSURANCE.

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EXAMINATIONS for life insurance form by no means a small portion of the routine work of a physician. Indeed, when we come to consider that possibly two-thirds of the physicians of the country receive more or less yearly income from this source, it is not surprising that a degree of interest is manifested in all that relates to questions bearing upon this subject. The interest is a growing one, and it seems but right that a work of this sort should chronicle the yearly progress made in all that bears upon this subject.

It is not necessary for us to go into figures to show the magnitude of the insurance interests in this country. The reports of the largest companies are sufficient to impress any one. A glance at the exhibit for 1887, giving the statistics of life insurance in the principal countries of the world, as shown in the *Insurance Inspector*, of London, is as follows: England, nearly ninety-seven thousand policies, with an average of two thousand dollars a policy; Germany, sixty-three thousand, average nearly one thousand two hundred dollars; Austria and France, thirty-seven thousand, the former averaging nearly seven hundred dollars a policy, the latter nearly two thousand five hundred dollars; New York, nearly one hundred and thirty-two thousand, and averaging three thousand dollars a policy. But we need not proceed further in this line. Suffice it to say that not only do we at present, as medical men, find ourselves pecuniarily interested to a great extent in the subject of life insurance, but the growing demands require that we shall post ourselves thoroughly in all that relates to this subject and understand the duties that these positions of responsibility carry with them.

In reviewing the literature that has accumulated on all the subjects bearing upon the question of life insurance during the past year, very little of real importance is to be noted. Possibly in

the future the attention of medical men will be called to the value of studies with reference to the earlier signs of disease, and we may have more to chronicle. Much has been written in regard to diagnosis of a differential character, and some statements made are of interest. The most important work is by Stillman,¹¹⁸² which contains almost everything bearing upon the subject of life insurance. Possibly the principal criticism that can be made is that there is entirely too much in it for the ordinary practitioner to read. If it had been condensed it would have been of much greater value. An interesting article on "The Relation of the Physician to the Insurance Company, the Applicant, and the Agent," by R. M. Stone,¹⁰⁶¹_{July} is clear and practical.

MORTALITY.

S. E. Chaillé, of New Orleans, ¹²_{Aug.} in a very interesting paper on life and death rates in New Orleans and other cities, shows specially the fact of the very great excess of mortality of the colored population, not only in New Orleans but everywhere else, over the white, and the excess of male mortality over the female. This our own experience has long since shown us, and confirms the decision of many companies to charge an extra rate upon the negro, especially the mulatto, and to take off the extra which has been usually charged to women.

The fact that the male and female mortality is more alike on the sea-board, especially on the northern coast, is due to the fact that at these points consumption forms a principal cause of death and that the female is more apt to show greater mortality from it than the male.

If it were possible for an insurance company to so regulate its premium tables as to suit the mortality in each individual section, these studies of statistics of localities would be of very much more value, but our population is, to a certain extent, a roving one, and when a man once receives his insurance he expects to be able to live in any locality he chooses, and we must, therefore, take the general average of mortality as our basis and not that of any particular city or locality. For instance, it has been found that expectation of life is greater in New Jersey and Massachusetts than the life tables for England and Wales. Also that the expectation of life of white males is less than in Charleston,

Brooklyn, New York, and Boston, and of white females much greater than in these places. In summing up this paper we are shown how faulty statistics are if we take the ordinary census figures upon which to base life insurance, for the exceptional mortality of New Orleans is found to be due to its disproportionately large colored population.

A paper by James Thorburn, ³⁹_{Sept.} medical director of the North American Life Assurance Company, is largely taken up with statistics that contain some very valuable hints to medical examiners. Among other points noted we may quote the following: "Often-times careless and slovenly reports are sent in, and, as it has been said, some examiners satisfy themselves as to the soundness of an applicant by a thump on the chest. I need not tell you that such an examination is of no use to the company, and is a disgrace to the profession. A thorough examination must be made in all cases; appearances are often deceptive." This paper goes somewhat carefully into the question of heredity, and shows its important bearing upon life risks.

We may also quote the following: "The responsibility of medical examiners is controlled by the principles of common law in all countries. For instance, in the State of Michigan, U. S. A., the law is as follows: 'Any person who, as a medical examiner for any such company, or as a referee, or any person seeking insurance therein, shall knowingly make any false statement to the company, or any officer thereof, concerning the bodily health or condition of the applicant for insurance, or concerning any other matter or thing which might affect the property or prudence of granting such insurance, shall be guilty of a misdemeanor, and on conviction thereof shall be liable to a fine not exceeding one thousand dollars, or to imprisonment in the county jail not exceeding three months, at the discretion of the court, and he shall also be liable to the company for an action on the case for the full amount of any insurance obtained from such company by means, or through the assistance, of such false statement or report.'"

Undoubtedly the effect of civilization, with the advancement of science in all its branches, the distribution of wealth, and the knowledge of hygiene, has lessened the mortality by increasing the duration of life. The introduction of vaccination alone has done much toward this end. We find that the Swedish statistics

show that from 1749 to 1801 there were three hundred and one thousand one hundred and sixty-five cases of small-pox, and that the death-rate was one-tenth; so that out of over one thousand inhabitants there were 2.8 cases of small-pox, and twenty-eight deaths in consequence of this disease. Vaccination was made obligatory in 1815, and these figures decreased respectively to .16 and to .01. "Ogle finds that in England the probability of male life, as for the years 1871 to 1880, increased up to the sixty-seventh year, and only from this forward has it decreased. As far as regards the female sex, the condition has improved up to the ninety-second year, and for the entire population up to the eighty-seventh year, so that a decided improvement for the proportion has taken place." The same in Sweden. From 1770 to 1790 for (over?) one thousand inhabitants 28.5 died, while from 1880 to 1885 only 17.5. In Rome, 1794 to 1800, thirty-nine; from 1880 to 1885, twenty-six. In France, at the end of the last century, thirty-four; from 1880 to 1885, 22.2.¹¹⁸³ Although these statistics are extremely interesting, they can only be of service to the very largest companies. A small company necessarily is obliged to depend on very careful selection of individual risks.

INEBRIETY.

The question of the use of alcoholic stimulants is a very important one bearing on mortality, and much has been written upon this subject within the year. As we have already stated, an insurance company should endeavor, as far as possible, to select its lives from the average class of human beings. Exceptions of all kinds must naturally have a mortality of their own. Now, this not only refers to age and occupation, but it also refers to individual habits, heredity, possibly even temperament. Statistics have shown that the mortality is less in England among the moderate drinkers than among the teetotalers, and this undoubtedly may be explained by the fact that the moderate drinkers form the largest class of the population, and that possibly their moderation in this line is an index to their moderation in other things, and it brings them under the class of the least mortality. There is undoubtedly the greatest difficulty in judging the exact amount of alcohol which an individual takes. There is no more difficult problem to solve in the whole of insurance than to know what moderate

drinking is. Shall we take his own opinion, or the opinion of the examiner, or the general reputation that the applicant has among his neighbors? Where the least suspicion exists as to the abuse of alcoholic liquors the examiner should first carefully investigate the effect they have had upon the system of the applicant. Do his functions normally perform their duties? Is his skin bright and clear, or mottled and congested? Are there any evidences of bilious derangement—coated tongue, nervous disturbance? These are most important. Then the question as to the amount that the applicant acknowledges indulging in and the character of his beverages should be considered. Does he drink between meals? Does he drink in the morning? An insurance company would always be safer to refuse a policy to one who acknowledges drinking before breakfast, as such an individual is certain to be classed among the intemperate.

The use of narcotic drugs comes also under consideration here, and should be most carefully inquired into.

AFFECTIONS OF THE MIDDLE EAR.

The question of chronic suppuration of the middle ear as affecting the death-rate is important. An article by A. R. Baker, of Cleveland,⁹²⁹_{Jan.} shows that it is most unadvisable to issue policies, except upon very high rates, to persons suffering from chronic suppuration of the middle ear. His paper is based upon fifty post-mortems where death resulted from this cause. He summarizes as follows: "These cases may be arranged in three classes:—

"1. Cases which may be accepted provisionally, *i. e.*, with an increased premium. Cases in which the purulent discharge has never been abundant or offensive or bloody; where the aural canal is of large size and free from all obstruction, and there is or has been no tenderness of long duration behind, above, or in front of the ear, no long-continued pain, giddiness, or other severe symptoms of intracranial difficulty, and in which there has been no discharge for one year or more.

"2. Cases which may not be rejected absolutely, but deferred until the affection is removed.

"3. Cases which should be rejected unconditionally: (1) all cases in which examination reveals a narrowing of the canal from exostoses or other causes; (2) all cases in which there are

present polypi or granulations within the tympanic cavity; (3) all cases in which there are desquamative processes within the middle ear or external meatus; (4) all cases with symptoms of caries or necrosis of the temporal bone; (5) all cases with paresis or paralysis of the facial nerves; (6) all cases with fistula of the mastoid cells; (7) all cases in which there is an abundant offensive discharge from the ear of long duration, and especially if bloody at times; (8) all cases in which there is tenderness or pressure or recurrent pain behind, above, or in front of the ear; (9) all cases in which there is giddiness, unsteadiness of gait, or other symptoms of cerebral disturbance."

DISEASE OF THE KIDNEYS.

Probably there is no one subject which has received more attention within the last year than kidney disease and its relations to life insurance. The detection of albumen or sugar and its bearings upon life insurance depends for its value upon various elements to be considered: (1) competency of the examiner; (2) importance of the discovery; (3) age of the individual and previous record; (4) causes of the mortality of the individual company as known only at the home office, which necessitates a selection of lives so as to obviate the tendency, as it were, to run in a groove. There are some companies, for instance, whose mortality seems for years to run in the line of kidney troubles, resulting from rheumatic or gouty diathesis, where it becomes necessary for them to be cautious in order to prevent, if possible, this drain. It is absolutely essential that every life insurance examiner should be able to detect the presence of albumen and to differentiate between it and other appearances that simulate it. The same may be said in regard to sugar, and also in regard to the appearances of urine under the microscope. In other words, the examiner must be an educated man; that is to say, sufficiently educated to make these examinations. Otherwise his services to the company are of no importance whatever. He must be extremely particular in regard to the cleanliness of all his utensils and the reliability of his reagents. He must satisfy himself of the fact that the urine presented to him is that passed by the individual in order to detect frauds or even to avoid suspicion of fraud. Starting, then, from a clear basis, his examination is presumed to be thoroughly reliable

and to be depended upon. The value of these early symptoms and their bearing upon life insurance has been discussed by Thomas Grainger Stewart, of Edinburgh,¹⁸⁸¹_{p. 550} whose conclusions on albumen may also be considered as true of sugar, though possibly many very slight disturbances, insignificant in themselves, will produce a trace of sugar in the urine that will disappear and be of no consequence. Stewart formulates his investigations as regards persons apparently healthy as follows:—

“1. That there is no sufficient proof that albumen is normally discharged from the human kidneys.

“2. That albuminuria is much more common among presumably healthy people than was formerly supposed, being demonstrable by delicate tests in nearly one-third of those examined.

“3. That the existence of albuminuria is not of itself a sufficient ground for the rejection of a proposal for life insurance.

“4. That traces of albumen are not infrequently present in urine passed during the first days of life.

“5. That, excepting as shown above, the frequency of albuminuria increases as life advances, being rare in children and young adults, and common in men at or above sixty years of age.

“6. That it is more common among those whose occupations involve arduous bodily exercise than among those who have easy work.

“7. That albuminuria frequently follows the taking of food, especially of breakfast.

“8. That moderate muscular effort rather diminishes than increases albuminuria, except in rare cases.

“9. That violent or prolonged exertion often induces albuminuria.

“10. That cold bathing produces or increases it in some individuals.

“11. That the discharge of peptones from the kidneys is exceedingly rare in the presumably healthy.”

Tyson,⁹_{v.1,p.545} in a paper before the Association of American Physicians at Washington, reaches the following conclusions:—

“1. The applicant must in all other respects present the signs of good health.

“2. The albuminuria should be unaccompanied by tube-casts. Casts and albuminuria conjoined can receive only one interpretation—structural change in the kidney, either acute or chronic.

"3. If the quantity of albumen is large the applicant should be rejected, irrespective of the presence of casts, where it habitually exceeds one-fifth the bulk of the specimen examined.

"4. A consideration which goes far toward establishing the functional character of an albuminuria, although not essential to this end, is the absence of albumen on rising in the morning. It must be taken in connection with the other considerations mentioned.

"5. A point of importance is the specific gravity of the twenty-four hours' urine. If we regard the specific gravity of a normal twenty-four hours' urine (say fifty ounces) as 1020 the following may be laid down: Albuminuria is least significant when specific gravity is high, throwing out, of course, the consideration of sugar.

"6. The signs of hypertrophy of the left ventricle and of high vascular tension associated with albuminuria are conclusive symptoms of renal disease, and should exclude candidate.

"7. A highly important consideration is the age of the candidate. It is questionable whether any person with seemingly functional albuminuria who has reached the age of forty should be accepted unless he has been under long observation by a competent and conscientious observer.

"8. The presence of true gout in any shape precludes admission to life insurance, being always sooner or later followed by interstitial nephritis.

"9. The retinal symptoms so commonly associated with chronic Bright's disease, although usually late in their appearance, do sometimes form the earliest noted sign of this affection, and whether or not conjoined with albuminuria must effectually exclude the candidate from its advantages."

F. de Haviland Hall ^{Feb. 18} probably more correctly appreciates the question of albuminuria from the stand-point of the insurance company. In his article upon this subject he quotes the sentence in Stewart's article, "that there is no sufficient proof that albumen is normally discharged from the human kidney." This question, then, is not, "Is albuminuria always an evidence of renal disease?" but, "Is the presence of albumen, even in the slightest tracing, in urine that has no other abnormal characteristic ever an evidence of ill health?" Any one, I am sure, who has had anything to do with life insurance will at once say that in a large number of cases it is simply a temporary derangement, of no more pathological

consequence than an ordinary cold in the head or a bronchial catarrh, and has the same consequence as these; but for the time being the applicant is not insurable.

The standard of the insurance company, based upon its mortality record of healthy lives, requires attention paid to these early symptoms, which may or may not be of any consequence, and, though a simple laryngitis or bronchitis may in nine cases out of ten be of no consequence whatever, the tenth case may be an evidence of some pulmonary trouble, acute or chronic; so in albuminuria, often when detected by the insurance examiner, it may be the first evidence of some morbid condition which would otherwise pass unnoticed.

We must remember that persons applying for life insurance usually apply before the usual physical signs and symptoms of disease present themselves. We are studying disease from the pre-symptomatic stage, but the patients presenting themselves to the doctor usually do so after having their attention called to their ailment by means of some special symptoms.

The most interesting series of investigations have been made by the medical staff of the United States Life Assurance Company, who have found that only 10 per cent. of the deaths of policyholders in their company occurred from Bright's disease. Careful study shows that 11 per cent. of the persons presenting themselves for life insurance, otherwise in a healthy condition, showed albumen in the urine after a test was made. A similar procedure in 1879 resulted in nineteen cases, or 12 per cent., and in 1880 twenty-six cases, or 10 per cent. Now, a careful following up of these cases showed that of sixty-nine in which albuminuria was found four died shortly after, and that many of the others showed deterioration of health.

Of course, it is extremely important that great care should be taken in testing for albumen in all cases. Possibly mistakes are frequently made by careless examinations, or, indeed, ignorance may frequently mistake mucus or phosphates for albumen. Unfortunately, the standard for medical education is not so high that insurance companies always have at their disposal competent examiners. Frequently in out-of-the-way places at a distance from the home office in Western cities that are springing up like mushrooms insurance business is very brisk, and the difficulty to obtain suffi-

ciently educated examiners is very great. Injustice may be done in many cases to many parties applying for insurance. There should be some standard test adopted by all companies which would forever settle the question of the presence or absence of albumen, and also of sugar. Our own preference would certainly be for boiling acidulated urine after it has been filtered, and applying the cold nitric acid test besides. The urine after a heavy meal should not be examined. It should not be tested at least for an hour after being passed and the specific gravity should always be taken. The same may be said of saccharine urine. The much greater difficulty which attends the detection of sugar, and its pathological significance in very small amounts, renders this question a much more difficult one than that of albumen. Very minute traces of sugar, so minute as to be debatable, I do not think are of sufficient importance to be taken into consideration in a question of insurance, but for all large amounts of sugar there should be a standard test, and none is better than Fehling's test, prepared freshly each time; and where sugar has been detected or suspected, the fermentation test should be used in addition. The specific gravity in these cases is, of course, very important, though undoubtedly records show that sugar has been present with a specific gravity comparatively low.

I am very much opposed to the word "functional" in this question of albuminuria. Physiological albuminuria, according to the authorities above quoted, Grainger Stewart and George Johnson, does not exist, but that there is a form of recurrent or intermittent albuminuria, which is probably dependent upon some disordered state of health, either due to defective metabolism or enervation, cannot be questioned. Like irregularity of the pulse and other disturbances, however, it may finally lead to permanent injury, though capable of being relieved by treatment.

H. F. Stokes ⁸⁰_{May 15} reports a case of intermittent albuminuria. Through the interval the applicant was accepted for life insurance, yet in this case the applicant, though in perfect health, had albuminuria when the urine was lithiacal, the patient being accustomed to drink beer in large amounts.

We may state, then, in conclusion, that all cases where albumen and sugar are found in the urine should be carefully investigated, the test studied, microscopical examination made, and the

case refused insurance until it has been positively ascertained that there is no pathological significance in the symptom, and that it has been of only a temporary character; and a postponement should certainly be made, for at least a year, or more, for final action. If the individual is over fifty it is a very serious question whether a company should insure him or not. If it does, the rate should be high. Of course, if a microscopical examination reveals the presence of casts, the matter is a very much more serious one. It is to be hoped that at some future period the great rivalry which characterizes the insurance companies of the day will be repressed by public feeling, and that some joint action will be taken by the medical officers to require a certain standard and to endeavor, as far as possible, to be in conformity in their decisions in certain matters. (See p. 8, section I., this volume.)

HEART-DISEASE.

The question of the insurability of a person in whom a heart murmur is present is a matter which has been discussed over and over again, and, undoubtedly, so long as the proper significance cannot be given to murmurs alone connected with the heart and its circulation, just so long will the uncertainty of their relation to longevity be undetermined. A heart murmur simply shows that there is something wrong either with the circulation, from some impediment to its progress through the cardiac cavities, or with the character of the circulating medium—the blood—and no more; and how far and to what extent this disturbance exists, and how it will affect the life of the individual, other evidences will have to decide.

When an examiner detects a cardiac murmur he should pay special attention to the following points and note them in his report: (1) the character of the murmur and position of its greatest intensity; (2) the time of its occurrence; (3) the position of the apex-beat and evidence of cardiac enlargement or alteration in the position or shape of the heart; (4) the symptoms that point to disturbances in the circulation; (5) the character of pulse as regards force, irregularity, intermittency; (6) the antecedent history of the case, questions of rheumatism, gout, or syphilis.

There is no question whatever among insurance men that every individual, however seriously affected by disease, has a cer-

tain expectation of life. If, for instance, we could take a thousand cases of cardiac disease in all its varieties and place them in one class, all renal disease or disease of the pulmonary system in another, then we could base upon their average mortality a certain premium which would make their insurance safe to the company; but this would not hold good for cases of all diseased risks indiscriminately mixed, as has been amply verified by the establishment of a company to insure impaired risks, and which very soon came to a close. In order, then, to arrive at this mortality it would be necessary to classify these cases, to study them on a very large scale, just as the general mortality upon which insurance rates have been based are deductions of nineteen English companies forming the Actuaries' Table. Moreover, it would require an entirely separate system of accounts, so intricate and so expensive that it would not pay a company to institute such a system. It is on this account that, judging from the stand-point of the home office, it is unadvisable to assume the responsibility of insuring individuals who are not up to the standard of physiological health, and on that account albuminuria, heart murmurs, vertigo, irregularities of heart or intermittency in its action, the presence of sugar in the urine, the occasional passage of renal calculi, however small, gout, in its visceral manifestations especially, although they may be simply transient, as far as the examiner can detect, and of little importance, should all require a postponement on the part of the company until they entirely disappear and the healthy condition of the applicant is restored. Scientifically it is of great interest, and probably in the future will be of very great advantage, for us to follow the prognosis of cases presenting certain symptoms that may or may not be evidence of pathological changes. Frank Donaldson, Jr., in a paper on "The Prognosis of Certain Heart Murmurs," ⁹ AUG. 20, '97 says: "The discovery of a murmur is not now regarded as an infallible indication of unavoidable and early death. We now recognize the numerous forms of disease to which this organ is subject; we discriminate one affection from another, and we distinguish between what are conditions of passing debility and anæmia, and those graver ones of dilatation, valvulitis, and fatty degeneration. This shifting of opinion as to the fatality of cardiac murmurs is beginning to work an important change in the selection of risks for life insurance in this country, as it has already done in England, where

valvular disease, as such, is no longer a cause for total rejection, and where increasing attention is given to the signs of dilatation and displacement of the heart and to deficiency in general circulation; the really risky cases are excluded, and the persons selected for insurance who seem to have as good a prospect of prolonged life as those who are passed as 'good' or 'fair' risks—in other words, the risks are graded—such cases being insured at a higher premium."

The prognosis of organic murmurs depends (1) on the valve affected and the relative danger attaching to the particular lesion; (2) the actual condition of the orifice and valve, and the degree of obstruction or amount of regurgitation to which the lesion has given rise; (3) the nature and tendency of the morbid change in the valve, whether stationary or progressive; (4) the condition of the muscular tissue of the heart, and how far compensatory changes may be counted on; (5) the mode of life of the patient.

Aortic stenosis proves fatal by the slow operation of dropsy, mitral regurgitation following as a result of dilatation. But the danger is not imminent so long as the aortic obstruction is uncomplicated by mitral trouble. Dropsy having once set in in a case of aortic stenosis, there is less probability of recovery than in most other valvular affections. Finally, most authors agree in placing aortic stenosis as the least dangerous of valvular troubles.

Aortic regurgitation, coming on late in life, is always serious. The disease is progressive, and finally ends either from a failure of the ventricle in systole (in which cases we have attacks of angina, paroxysmal dyspnoea, weak and very irregular pulse, etc., but no dropsy), or death ensues from venous obstruction, and the symptoms do not differ materially from mitral insufficiency. Sudden death may be expected and is the rule in aortic insufficiency.

Mitral insufficiency is probably less serious than aortic stenosis, which is placed lowest in the scale of danger. A circumscribed mitral murmur, not heard in the back, is of little import; but care must be taken not to take the soft murmur of a gaping orifice and a weak heart as an indication of slight mischief.

Dr. Thompson gives the following data from his own experience in two large life insurance companies, where risks with heart murmurs are "rated up:" "Taking the experience of one of my own offices, I find from the last analysis of invalid lives that of five cases rated up for disease of the mitral valve the average age of

the insurers was thirty-five years, the average addition twenty-three years, and no deaths occurred during the period comprised in the report; whilst out of fifteen cases in which the nature of the heart-disease is not specified the age was forty-one, average addition eight years, and three deaths occurred. From the subsequent course of these cases it appears that of the first series, those with mitral disease, two have since died, one after being insured for thirteen years, to whose actual age seven years had been added. Had twelve been added no loss would have occurred to the office. In another fatal case, which also occurred from heart-disease, ten years had been added to the actual age, but the policy-holder died at the end of five years, and an addition of twenty years would have been needed to save the office from serious loss. In two other cases of the mitral series the results have been good; the cases were rated up to twenty and twenty-five years respectively, and are now living, having been insured, one for twenty-two and the other for twelve years. Taking this series alone, the gains fairly balance the losses.

“In the other class, that in which no definite valvular disease was mentioned, six deaths have occurred, one by accident one year after the policy was taken out, and two others at short periods, viz.: six years and nine years. In two they lived twenty-seven and eighteen respectively.

“Of the seven cases now living, all have lived long enough to cover loss, and three have proved very advantageous. Thus, this class, like the first, has not been found by experience unsatisfactory, although in many of the cases the extra rating has not been nearly sufficient, and, curiously enough, this is specially true with the lives that have proved unfortunate.

“The general results of the experience of these cases have been confirmatory of the received opinion that where definite heart-disease exists a really considerable addition is demanded.

“Functional murmurs are invariably systolic in time, and are heard, as the case may be, (1) over the true pulmonary area, close to the left of the sternum between the second and third ribs; (2) over a space of about an inch and a half to the left of the sternum, and in the second interspace just where the left auricle comes up from behind to the left of the pulmonary artery; (3) over the aorta. The murmurs in these three situations are usually found

in some form of chlorosis or anæmia, or in the course of acute febrile disease, and may be dependent upon a changed condition of the blood, constriction or dilatation of the artery, or acute dilation of the heart. Pulmonary systolic murmurs are more frequent than any other form of cardiac murmurs."

The question of the pulse is important in this connection. A pathological pulse may be dicrotic, thready or wiry, gaseous, hard or tense, intermittent, jerking, quick and full, slow and full, and small and weak (C. Coleman Benson¹⁷⁶_{Jan}). The normal pulse is from 65 to 80, and is increased in frequency by exercise, excitement, nervous temperament, febrile condition, all of which must be differentiated.

APPEARANCE OF THE TONGUE.

Although not much stress has been laid upon it, the importance of the tongue as an early indication of disease cannot be overestimated (W. H. Dickinson²_{v.1,p.625}). These have been classed as follows: "(1) healthy, moist; (2) stippled, dotted with white; (3) stippled and coated, coat continuous in parts; (4) coated white, coat continuous; (5) strawberry, coated and injected; (6) white, plastered; (7) furred or shaggy; (8) incrustated, dry, brown; (9) furred or incrustated, becoming bare, generally dry; (10) denuded, red; (11) red, moist; (12) cyanosed."

PHTHISIS.

The early detection of pulmonary disease or tendency thereto comes up for our consideration, and at once we call to mind the pathological significance attached to the winged thorax, the flat chest, indicative of phthisis, the pigeon-breasted thorax, the result of early rickets, the barrel-shaped thorax denoting emphysema, as the results of either early cardiac diseases or of asthma. We have also to bear in mind not only the importance of expansion as indicated by the number of inches on a tape-measure, but the symmetrical character of the expansion, which would indicate that all portions of the lungs received their proper amount of air.

In examining the lungs for life insurance there are several things to bear in mind which are of the greatest importance, and in order to make a thorough investigation the applicant should remove the outer clothing and retain but the flannel shirt next to the skin. There should be no tight bands restricting the action

of the abdominal muscles. The chest should be allowed full play, as far as its expansion is concerned, and there should be nothing to interfere with a thorough investigation of all portions of it. The apices should be first carefully auscultated in order to test the amount of air that goes into them and the character of its entrance and exit. This examination of the apices is most important, both from the anterior portion of the chest and from the posterior. The applicant should then be made to stand with the heels close to the wash-board and the back against some firm surface, the wall or the door, and in that way, the figure being erect, the chest will be thrown out so that upon percussion the sounds will be plain and denote the character of the tissue beneath. Beginning at the apices, the percussion rate should be elicited with a comparison of both sides. The area of cardiac dullness should be mapped out, also of hepatic dullness, and posteriorly attention should be paid to any evidences of chronic pulmonary disease, not only in the apex, but also in the base, as the result of pneumonia or pleuritic adhesions.

FAMILY RECORD AND TRANSMISSION OF DISEASE.

One of the numerous difficulties to contend with in this country is the uncertainty of the family record. Any one who has had any experience in life insurance will agree at once with this statement. Intermarriage; insufficient statistics, in fact, none at all in many cases; the large proportion of insurers, or certainly their fathers before them, being immigrants; the great mixture of races, which possibly also to a certain extent will influence our table of longevity one hundred years to come; the little interest which is taken in this subject by people generally, and, more than all, the uncertainty as to causes of death, render family history beyond the parents, in the majority of cases, absolutely unreliable. For practical purposes the age and the length of the illness are sufficient evidence of a tendency to transmit. Thus, if a grandparent is reported to have died at the age of thirty, and family tradition shows an illness of some duration, the chances are that we have a chronic pulmonary disease to contend with. Sudden death at middle age would naturally point to heart-disease or apoplexy. Atavism undoubtedly would be of great importance, provided we could always be sure of the statement made. As it is, in the selection of lives we are

obliged to consider simply the question of the age at death and the probable effect on the individual from any disease which is constitutional and which tradition has impressed upon the family. Thus, an applicant, when asked if there are any cases of rheumatism, may say, "Yes, that is a disease which many members of my family have. We never have consumption or any pulmonary disease, but there have been a number of cases of rheumatism in the collateral branches." It may be that gout has appeared in different members of the same family—possibly an ancestor has died of disease of the kidneys. Or, again, heart-disease is simply an evidence of rheumatic origin and in all probability one which is manifested in early life and may be shown in different members of the same generation, or possibly in successive generations, indicating rheumatic diathesis.

Insanity is also an important matter for investigation, not so much from the fact that insanity alone, when due simply to mental derangement, is calculated to shorten life, but from the great tendency to suicide and the fact that most companies have divested their policies from all restriction of this character. The medical examiner, then, should not simply content himself in seeing that the questions are properly filled out, but should inquire further into the family record and satisfy himself that there is no family disease.

The laity do not understand the importance of constitutional diseases upon expectation of life. For instance, the inheritance of gout is considered simply of importance when it shows itself in the usual gouty signs in the smaller joints, and when these are not manifested the individual considers himself as having escaped, little knowing how important a gouty diathesis is in its bearing upon disease of the kidney.

Again, with rheumatism: unless one has an acute attack of articular rheumatism no importance whatever is placed upon heredity in this disease, whereas we all know its bearing upon latent arterial degeneration, resulting in thrombosis, embolism, or apoplexy, and in disease of the heart.

The question of syphilis, whether hereditary or acquired, scarcely receives the attention it should in the selection of lives. In fact, we may say that we never come across a case at an insurable age where direct heredity has been stated. Of the acquired

form, the usual belief is that after a certain number of years of successful treatment it is entirely eradicated, and yet every practitioner of experience knows the full value of certain obscure diseases in middle life, whose phenomena are inexplicable until the knowledge of early syphilitic lesions has been divulged. The cases of aneurism, of cerebral diseases, of affections of the liver, are all evidences of this.

In looking over papers of life insurance which give the family record, the words "childbirth," "change of life," are much too often met with as causes of death. These should never be allowed by a medical examiner to go to the home office without an explanation. Cases of pneumonia should be distinctly explained, for in the majority of cases the word "pneumonia" is simply put in to cover the word "phthisis," which should be inserted. "Died in the army" is another frequent case, or "the result of the war;" all these should be investigated.

Another important question to be considered is that of transmission. Personal resemblance does not always go with a tendency to disease. Holden lays stress upon this point, also stating that the transmission is more frequent from father to son and from mother to daughter; and, quoting the experience of John Mamm, of the New York State Asylum, we find 54.6 per cent. of transmission to sons from fathers, 45.3 per cent. from mothers; daughters from mothers, 54.4 per cent., and from fathers only 45.4 per cent. The strumous diathesis has an important bearing on life insurance. Quoting again from Holden: "It is apt to entail a clear, fair complexion, a quick and precocious intellect and early degeneration, but occurs from mixed marriages. Consumption is its most frequent manifestation and its tendency to be transmitted is marked." The Brompton Hospital Report, 1849, shows that transmission of the tendency is, more especially, from father to son; 59.4 per cent.; to daughters, 43.5 per cent.; daughters from mothers, 56.5 per cent.; sons from mothers, 40 per cent.

It is questionable whether the discovery of the tubercle bacillus will change the value of life insurance statistics.

Old age of ancestry has a marked bearing on the question of longevity. Holden says: "From printed questions recently sent to two hundred men of seventy-five and upward, I obtained clear and full replies from one hundred, and give the results: five were

seventy-five; twenty-one, seventy-six; nineteen, seventy-seven; fourteen, seventy-eight; eight, seventy-nine; nine, eighty; ten, eighty-one; three, eighty-two; four, eighty-three; one, eighty-four; two, eighty-five; one, eighty-eight; one, eighty-nine; one, ninety; one, ninety-five.

"In 70 per cent., one parent had survived seventy years; in 47 per cent., eighty years. In 88 per cent., a parent or grandparent had survived seventy years; and in 73 per cent., eighty years. In 50 per cent., a grandparent had passed eighty years. In 81 per cent., a brother or sister had survived seventy years.

"The families were prolific, and averaged between six and seven children. Including grandparents, there were one thousand two hundred and seventy-six members, one thousand and seventy-eight accounted for, and two hundred and sixty-nine living. Only forty cases of consumption had occurred, 3.6 per cent. of those accounted for, and 4.9 per cent. of total deaths, as compared with 10 to 15 per cent. in the community at large; twenty-eight cases of heart-disease (nineteen families), 2.6 per cent.; twenty-seven cases of apoplexy or paralysis (twenty-five families), 2.5 per cent.; twenty-six cases of cancer (seventeen families), 2.4 per cent.; Bright's disease in three families only, and insanity in but two. The chief causes of death were inflammatory or zymotic. Deaths in infancy were infrequent, only 6.9 per cent. under ten years of age. The size of families and the freedom from disease dreaded by life companies are remarkable features."

PERSONAL CONDITION, AGE, AND EXPERIENCE OF DISEASE.

The questions of personal condition, age, and experience of disease in selection, according to Holden,¹¹⁸¹ "are weighed in connection with family tendencies. Young men have undeveloped records, and, as already shown, do not yield a favorable mortality; the middle-aged are the best; old men, however sound, should belong to long-lived families. The age is important in connection with the fact that, in spite of prevalent belief, consumption, cancer, apoplexy, paralysis, and disease of the kidneys show increase of mortality with advance of years, being greatest after fifty and sixty.

Thus, in corroboration, out of ten thousand living at each age the mortality is shown:—

	Age.	Wurz- burg.	N. Y. City.	M. Ben. Life.	U. S. Census.	M. Life Exp.
From consumption	20 to 25	30.2	70	22	23	24
	25 to 30	36.7				
	30 to 40	41.1	72	20	27	20
	40 to 50	48.4	65	14	27	17
	50 to 60	67.9	83	14	31	14
	60 to 70	93.1	115	27	40	18
	70 to 80	61.7	150	37	79	30
	80 plus.	25.8				
From heart-disease	20 to 30	. .	7.5	1.5	. .	1.2
	30 to 40	. .	9	1.7	. .	2
	40 to 50	. .	12.7	5.3	. .	4.1
	50 to 60	. .	22.7	14.5	. .	10.6
	60 to 70	. .	85.3	33.5	. .	36.7
	70 plus.	. .	89.9	82.8	. .	73.2
From disease of nervous system	20 to 30	. .	8.7	3.1	. .	5
	30 to 40	. .	13.5	7.5	. .	8.3
	40 to 50	. .	19.4	16.4	. .	14.9
	50 to 60	. .	38.9	34.6	. .	28.3
	60 to 70	. .	82.9	79	. .	69.4
	70 plus.	. .	200.4	. .	. .	133.6

"The figures for cancer and disease of kidneys are omitted for want of space, but a similar increase prevails. From cancer, twice as many deaths occurred in the Mutual Benefit Life between age of fifty and sixty as between forty and fifty, seven times as many between sixty and seventy, and ten times as many after seventy.

"Females, as a rule, live longer than males. Of twenty-seven thousand and three deaths in New York City, one hundred and eleven were over ninety—seventy-seven females and thirty-four males.

"Height and weight should approximate the average. Light weights are unfavorable; rapid or recent loss is suggestive of carcinoma, diabetes, or phthisis, and after fifty especially so (Mac-lachlan). Most companies reject all 25 per cent. below or 45 per cent. above the following standard:—

Height.	Weight.	Chest.
5 feet, 1 inch.	120 pounds.	34.0 inches.
5 " 2 inches.	125 "	35.1 "
5 " 3 "	130 "	35.7 "
5 " 4 "	135 "	36.2 "
5 " 5 "	140 "	36.8 "
5 " 6 "	143 "	37.5 "
5 " 7 "	145 "	38.1 "
5 " 8 "	148 "	38.5 "
5 " 9 "	155 "	39.1 "
5 " 10 "	160 "	39.6 "
5 " 11 "	165 "	40.2 "
6 "	170 "	40.8 "
6 " 1 inch.	175 "	41.5 "

“The girth of abdomen should not exceed that of the chest on expiration. The expansive power of the chest should be at least two inches. With auscultation and percussion the examiner should be familiar, and report exactly what they reveal for the information of the home office.”

OBLIGATIONS OF MEDICAL EXAMINERS.

The tables upon which the rates of mortality generally in use have been established are based upon the study of selected healthy lives. Everything has been eliminated that would tend to shorten a human life, personal record, family history, and occupation, and this average human life is made the basis of the calculation of the yearly premium. This being, then, the foundation of the whole subject of life insurance, the duty of the medical examiner is plain and can be summed up in but few words. He is employed by the company as a photographer, to give a pen-picture from careful and thorough examination, as life-like as possible, neither exaggerating the defects nor lessening the importance, and completing his work by a statement of the estimate upon which he places the facts that have been discovered by him, judging from opportunities which his position has given him to investigate.

Upon the medical department at the home office devolves the responsible duty of the selection of lives. Let me, then, impress upon the examiner who has been selected that his duty does not call upon him to make the selection, but he is simply a confidential employé of the company, to give them certain information upon which their decision is based.

It will now be seen that, having definitely stated the duties of the medical examiner, we bring forward certain points which bear directly upon this subject: (1) to whom is this medical examiner responsible? (2) what are his duties? (3) how should he fit himself to discharge them?

The medical examiner should be appointed directly by the home office and be under obligation to no one but the company itself for any pecuniary interest in the case examined. He should have no pressure brought to bear on him to influence in any way his appreciation of the value of the symptoms that his examination brings out. He should not be the family physician, owing to the

embarrassment that naturally arises from his statement of facts which might have to come to him in that capacity.

Each large insurance company has found it necessary to lay down certain rules to guide their medical examiners when acting for them. These rules are more or less the same, as far as general advice is concerned, and are often thoughtlessly laid aside, and thus irregularities in the smaller details are constant. An examiner, when appointed by the home office, should carefully read over all instructions sent to him in order to know how that particular company requires its business to be done. If he lives in a small village he may represent a number of the largest companies, and if he is a physician of repute, one whose name is respected in the neighborhood, the companies will seek him to represent them, feeling that their interests are safe in his hands. Under these circumstances he should as carefully as possible guard those interests and act with conscientiousness. He should avoid any appearance of partiality for any company, and let each agent feel that his case is safe in his hands. This is most important, and is frequently the cause of favorable comment or otherwise at the home office.

It is to be hoped that in the near future a special course of lectures will be provided at some or all of our post-graduate schools for those physicians who wish to prepare themselves specially for making insurance examinations. To one who is thrown much with medical examiners it will be seen at once that they do not, as a rule, fully comprehend the position which they are called to fill.

When a physician is called upon by a patient, the patient immediately begins a recital of the details of his case, explaining fully his symptoms, and aiding the doctor in locating his disease. The examination for life insurance is exactly the reverse. The applicant in all probability considers himself a perfectly healthy man. At first he was averse to insurance; he has been finally convinced of its importance; he has dreaded the medical examination, fearing he may not pass, but the agent has convinced him that there is nothing the matter with him, and he feels satisfied that if he has any symptoms that have hitherto annoyed him that they were only trivial and would not affect his life. This feeling is so strongly impressed upon him that instead of exaggerating his symptoms he will so undervalue them as frequently not to mention

them at all, often, indeed, in perfect good faith, and with no idea whatever of acting dishonorably toward the company.

As a rule, with the present careful selection of agents, and the system which most companies adopt of thorough investigation from all sides of the case before a policy is granted, frauds in life insurance are not nearly so apt to be perpetrated as they used to be. Nevertheless, they do occur, and it becomes the duty of every examiner to so equip himself with a thorough knowledge of the appearance and symptoms of disease that he will be able to detect irregularities that present themselves, and so arrange his questions and proceed with his examination as to prevent as far as possible any concealment with intention to defraud.

It has often been stated that to medical selection has been attached too much importance. Undoubtedly this deserves but a passing notice, for the fact has long since been established that a just discrimination will lead to diminished mortality. It is considered that the majority of persons most easy to convince of the importance of insurance are those who feel the necessity for it, whether this is brought about by a knowledge of their physical weakness or the realization of the strain that is placed upon them by business transactions. A company that obtained a reputation, whether justified or not, for carelessness in medical selection would at once become the receptacle for the overflow of all the discarded risks of more strict companies. I feel satisfied that an understanding of the selection of lives is one to which too much importance cannot be attached. The medical department at the home office should avoid all tendency to run in grooves. The statement that this particular company is strict about family record, another equally so about Bright's disease, or heavy weights or light weights, is an expression often heard. There should be an average selection, avoiding as far as possible exceptional cases of every sort, grouping the insured under the law of averages, and in as simple a manner as possible approach the normal standard. Undoubtedly the mortality will eventually prove this correct.

There is another important matter to take into consideration. The world is composed of different strata of society. These are produced by social distinctions, occupation, and financial condition. If we could take the general mortality, as shown in the health reports, as our standard for insurance, all these classes of

individuals would be represented. Not so with life insurance companies, however. Each company, whether owing to the selection of its agents or to its reputation, insures to a certain degree in one of the strata more than in any of the others. Its mortality will be affected by that of the class of individuals who are its policy-holders. I know of one institution all of whose policy-holders are active young men who are engaged in outdoor pursuits, and who, for certain reasons, have sought the insurance, not the reverse, as is usually the case. In two years over five hundred policies were issued for over one million dollars, and yet in that time there was but two deaths, and both from accidents. The selection of lives in this case was in very competent hands and the company was greatly benefited by it. This subject has been well treated by Dr. Edgar Holden,¹¹⁸¹ of Newark, N. J., who very correctly considers this matter of the selection of lives as one of very great importance, proving by the tables of several reliable companies its value.

But in order to make a proper selection it becomes necessary that sufficient data should be afforded, coming from a reliable source, and this reliable source is the report of a well-educated and conscientious examiner.

DISEASES OF THE BLOOD AND SPLEEN.

By FREDERICK P. HENRY, M.D.,
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GENERAL CONSIDERATIONS.

AFTER a large number of examinations (five hundred and forty-one) of the blood with reference to its percentage of hæmoglobin, G. D. Wilkens, of Stockholm,³⁷⁰_{v.7,p.433} expresses himself very positively to the effect that the standard of Fleischl's hæmometer is too low for healthy men of Stockholm and its environs. He has counted the corpuscles and estimated their value in a large number of diseases. In chlorosis he has found the corpuscles reduced to one-half and the hæmoglobin to one-fourth the normal value. The smallest number of corpuscles was encountered in a case of pernicious anæmia and was five hundred and twelve thousand per cubic millimetre. In a girl of thirteen years of age, with purpura hæmorrhagica, he found the percentage of hæmoglobin represented by the figure 15. In the anæmia consecutive to hæmorrhage he found, in one case, the same hæmoglobin percentage and the corpuscles reduced to 2.1 millions. In accordance with the observations of others, he found that the number of corpuscles was restored after hæmorrhage more rapidly than was the percentage of hæmoglobin.

In examinations of the blood after hæmorrhage, the time at which such examinations are made should always be stated, because the percentage of corpuscles is not materially altered immediately after even a profuse loss of blood, while the volume of the blood may be enormously reduced. In a few days the volume is restored and the percentage of corpuscles proportionately reduced. Wilkens' examination in the case just referred to was evidently made a considerable time after the hæmorrhage.

In acute pneumonia the reduction in number and value of the corpuscles was quite insignificant. After abstinence from alcohol for twenty-three days, the hæmoglobin in the blood of a chronic drunkard increased 50 per cent. In acute articular

rheumatism, Wilkens was unable to detect any diminution in the number of the blood-corpuscles, although the average value of the hæmoglobin was but 95 to 96 per cent. This does not correspond with my experience, as I found the state of the blood in a case of subacute articular rheumatism represented by the following figures: Number of red corpuscles per cubic millimetre, three million two hundred thousand (64 per cent.); color, 40 per cent. No increase in the white cells. There was no cardiac trouble. The examination was made at the Philadelphia Hospital on May 12, 1888. Wilkens sums up the results of one hundred and twenty-six examinations of the blood in various affections with the statement that in most diseases the hæmoglobin is reduced and in a direct ratio to their gravity.

As the result of numerous observations, E. Græber⁵⁴_{No. 14} announces that microcytes and poikilocytes are not present in the circulating blood. Microcytes are the result of a rapid and uniform withdrawal of water from the corpuscles, while poikilocytes are partly the result of mechanical lesions and partly of a gradual and unequal withdrawal of water. Admitting these views to be correct, they do not impair the diagnostic value of the combination of microcytes and poikilocytes in the blood of pernicious anæmia, as studied outside of the vessels. In the disease referred to, the red corpuscles certainly undergo some change which causes them to assume abnormal shapes when withdrawn from the circulation. Græber considers the proportion of white cells to red increased when it exceeds one to four hundred, and diminished when it is less than one to one thousand. He believes that the endeavors of Ehrlich to determine the source of the white cells from spleen lymph-glands or bone-marrow, by their optical appearances, are unsuccessful. He distinguishes two kinds of cells, a uninuclear and a multinuclear, to the first of which belongs about 24.5 per cent. of the entire number.

Joh. Loos,⁸_{No. 15} an assistant in v. Jaksch's clinic, has made a number of examinations of the blood with v. Fleischl's hæmometer and Hénocque's hæmatoscope, with the object of comparing the two instruments. In forty-eight examinations the two instruments gave the same figures only twice. In the remaining forty-six, the instrument of v. Fleischl gave a higher figure thirty-two times, Hénocque's instrument a higher figure fourteen times. There is

little difference between the two instruments, either as regards accuracy or convenience. A disadvantage of Hénocque's instrument is that it requires about six drops of blood for the test, and this is an amount which cannot be obtained from the finger in many cases of pernicious anæmias. This I can vouch for from a large experience in such examinations. On the other hand, the spectroscopic examination which is always made with Hénocque's instrument, besides determining the percentage of hæmoglobin, may disclose other interesting conditions. For example, in the blood of a phthisical boy who had taken a large dose of phenacetin, and presented a cyanotic appearance, v. Jaksch found the spectrum of methæmoglobin. The most interesting application of Hénocque's instrument, and one which may lead to important results, is that of determining the activity with which arterial blood is reduced to venous while circulating in the tissues. It has long been known that the spectrum of the circulating blood could be obtained; for example, by examining the light that has passed between two fingers held almost in contact. Hénocque, however, was the first to turn this fact to clinical profit. He chose as the point of observation the subungual surface of the thumb and found that, in a strong light, the two absorption bands of oxyhæmoglobin are distinctly visible. On applying a ligature around the first phalanx, the blood is imprisoned in the extremity of the thumb, and in a few seconds the hæmoglobin is reduced and the absorption bands disappear entirely, for the single absorption band of reduced hæmoglobin cannot be seen with the spectroscope used in this manner. The time necessary to reduce the oxyhæmoglobin, in other words, to consume the oxygen in the capillary net-work, varies between twenty-five and ninety seconds, the mean being sixty seconds. The activity of reduction is altered by fasting, by eating, by repose, by muscular effort, by cold, electricity, and, as a matter of course, by all pathological conditions of the system. The want of space forbids a detailed description of this ingenious apparatus,¹⁵² which bids fair to add greatly to the facts of hæmatology.

ANÆMIA AND CHLOROSIS.

In a course of lectures delivered at the Hôtel Dieu, Germain Sée¹⁷_{p.145} draws the following distinctions between true and pseudo-anæmia. The alterations of the blood in true anæmia are, he

says, conformable to one of three types: 1. The anæmia from hæmorrhage, characterized by a diminution "*en bloc*" of all the elements of the blood. 2. A type characterized by hypohæmoglobinaemia, *i. e.*, a deficiency of hæmoglobin, either quantitative or qualitative. 3. A type in which the number of the red globules is reduced. Under the head of pseudo-anæmia he places (1) the various forms of inanition; (2) exhaustion; (3) chronic intoxication. To show the difficulties in the way of a classification of the various forms of anæmia and the contradictions involved in the one adopted by Sée I need only indicate the fact that in the third group of his pseudo-anæmias he includes poisoning by carbonic oxide, a substance which paralyzes the function of the red corpuscles by displacing the oxygen so loosely combined with them, and forming a remarkably stable combination of oxycarbohæmoglobin. Now, for the sake of that consistency without which a classification is absolutely misleading, this form of "pseudo-anæmia" should be included in the second group of true anæmias, which are characterized by a deficiency of hæmoglobin "either quantitative or *qualitative*." By anæmia is generally understood some defect in the quantity or quality of the blood, and as such defects are present in the various affections described by Sée as pseudo-anæmia, there seems no good reason for distinguishing them from primary anæmia, except by the term secondary. The alterations of the blood produced by various gases and mineral poisons should be placed, as is done by me,^{1176, 1887} under the head of toxanæmia.

Certain writers continue to regard chlorosis as invariably associated with a special alteration of the blood, *viz.*: a diminished percentage of hæmoglobin, the number of the red corpuscles being normal, although there may be alterations in their size and shape. Graeber⁵⁴_{No. 14} is a firm adherent of this view, and speaks of chlorosis being complicated with anæmia when, with all the symptoms of chlorosis, the number of red corpuscles is found reduced. He states that the complicating anæmia may be cured, *i. e.*, the number of the red corpuscles restored, by nutritious food and good hygienic surroundings, whereas the chlorosis cannot be cured, *i. e.*, the normal percentage of hæmoglobin restored, without iron, and generally in large doses. The following table, in which N. stands for the number of red corpuscles and H. for their percentage of

hæmoglobin, contains Graeber's classification of the different forms of anæmia:—

N. increased, . . .	H. increased, . . .	= Plethora polycythæmia.
N. normal, . . .	H. normal, . . .	= Health.
N. normal, . . .	H. diminished, . . .	= Chlorosis.
N. diminished, . .	H. relatively increased,	= Pernicious anæmia.
N. diminished, . .	H. diminished, . . .	= Anæmia.

Sée¹⁷_{p.181} quotes the conclusions of Grüber concerning the blood in chlorosis: 1. The number of the red corpuscles remains about normal, rarely descending below four millions four hundred and eighty thousand per cubic millimetre. 2. The size of the globules is, in some cases, slightly diminished, but there are no characteristic changes in their shape. 3. The hæmoglobin is reduced, sometimes as low as 5 per cent., the normal amount being 14 per cent. The alkalinity of the blood is increased, sometimes decidedly so, and this is regarded by Grüber as being almost pathognomonic of chlorosis. Wilkens³⁷⁰_{v.7,p.433} has found, in a case of chlorosis, the percentage of hæmoglobin reduced to one-fourth and the number of the red corpuscles to one-half the normal amount. Such a condition would be described by Graeber as one of chlorosis complicated with anæmia. In my opinion, the condition of the blood in chlorosis depends upon the stage in which it is examined. In the first stage, which may persist indefinitely in those whose appetite is good and whose food is nutritious, the number of corpuscles is normal while the hæmoglobin is more or less deficient. In those whose hygienic surroundings are less favorable the corpuscles are soon reduced in number.

In the well-marked case of a young girl, aged seventeen, a member of a family in affluent circumstances, I¹¹⁷⁶₁₈₈₇ obtained the following figures as the result of an examination of the blood: Number of red corpuscles per cubic millimetre, two million six hundred and ninety thousand (54 per cent.); color (hæmoglobin), 32 per. cent.

It is not at all necessary—on the contrary, it is confusing—to regard such a case as one of chlorosis complicated with anæmia. The case was simply one of chlorosis in the second stage. It is a question worthy of careful study whether chlorosis may not terminate in a third, a pernicious, stage. I have already raised this question and answered it in the affirmative,⁹_{July 5, '96} and Trechsel¹⁹⁷_{June 20} has observed two cases of chlorosis which ran a similar course.

Symptoms.—Those symptoms of chlorosis which are common to anæmia in general are so well known as to need no description. Certain anomalous symptoms are, however, occasionally observed, one of which deserves special notice on account of its bearing upon the view just mentioned, that chlorosis may become pernicious. The symptom referred to is fever.

According to Trazit,²¹²_{Nov.} whose thesis is devoted to the subject of febrile chlorosis, there are certain negative peculiarities in this form of fever which distinguish it from all others. These are principally referable to the urine, which is pale, abundant, and, above all, contains but a small percentage of phosphates. In fact, the only symptoms of febrile chlorosis, according to him, are tachycardia and hyperpyrexia. The first may exist alone for some time, the latter making its appearance after an increase of gastric disturbance or menstrual disorders. It may be of continuous, intermittent, or remittent type.

Jaccoud,³_{Aug. 8} who believes that fever would be more frequently found in chlorosis if sought for, attributes it to *anoræmia*. The deficiency of oxygen in the blood may, he thinks, act as an exciter of the calorific centres. In chlorosis, as in other diseases, fever may be due to local disorders, one of which is phlegmasia alba dolens. Perret,²¹¹_{June 24} reports three cases of phlegmasia occurring in the course of chlorosis. It was bilateral in each instance and in two appeared at an early stage of the primary affection. Another case is reported by Laurencin,²¹¹_{Oct. 7} also bilateral, in which death occurred from embolic pneumonia. The exciting cause of the affection was a long walk in the snow. Mosnay,²¹²_{July} discusses the differential diagnosis between phlegmasia and other, especially rheumatic and neuropathic, forms of œdema. Pouzet, of Cannes,⁴⁶² calls attention to a peculiar pigmentation of the dorsal surfaces of the fingers, which was first described as a symptom of chlorosis by Bouchard, of Paris. This pigmentation, which is mistaken for dirt until repeated washing fails to remove it, covers the dorsal surfaces of the second phalangeal articulations. In silk factories, where chlorosis is, so to speak, endemic, Pouzet has observed this pigmentation in the hands of nearly all the employées. It is not caused by the work in which they are engaged, for the same discoloration is seen in young women who are not engaged in manual work.

Treatment.—Sée¹⁷_{No.97} rarely prescribes iron in chlorosis. It is not uncommon, in this disease, to find an excess of hydrochloric acid in the gastric secretions, and in such cases he prescribes an almost exclusive diet of meat and other albuminous foods. He gives raw meat to the extent of three hundred to four hundred grammes daily, and in that manner supplies the system with iron naturally combined with albuminates. Jaccoud³_{Aug.8} utters a protest against the belief that the only treatment of chlorosis is ferruginous, and places inhalations of oxygen in the first rank in the treatment of this disease. On the other hand, Graeber⁵⁴_{No.14} is a firm believer in massive doses of iron, of which he believes the effect is to diminish the alkalinity of the blood. The following formula is employed by Paquet,²²¹_{v.2, No.8} who finds the bromide of potassium useful in the numerous cases in which nervous disorders are conspicuous:—

R Tinct. ferri chlorid.,	3	1	(31.1 grammes.)
Quinæ sulphat.,	3	1	(3.9 “
Solve et adde:			
Potass. bromid.,	3	1	(31.1 “
Aq. puræ,	3	24	(746.5 “
Liq. potass. arsenit.,	3	2½	(9.7 “

M. Dose for an adult, two teaspoonfuls to a tablespoonful in a little water after each meal.

In the treatment of chlorosis, the importance of maintaining free and regular evacuations of the bowels is generally recognized. Sir Andrew Clark has done good service in recalling the attention of the profession to this point, although it was recognized twenty years ago by Hudson,²²_{May 9} who taught that anæmia could not be cured so long as the bowels were confined.

PERNICIOUS ANÆMIA.

Nature of the Disease.—The confusion of ideas concerning this affection is well illustrated by a discussion at a meeting of the New York Academy of Medicine on March 20th. The discussion, in which Delafield, Kinnicutt, Draper, Beverley Robinson, and W. H. Thomson took part, followed the reading of a paper on “Pernicious Anæmia”⁵⁹_{Apr.14} by J. West Roosevelt. Delafield “doubted whether we ought to call it a blood disease or whether we knew what it should be called,” and Thomson said he “had come to the meeting expecting to have his previously formed ideas of pernicious anæmia made a little more distinct, but instead they had grown

more indistinct." An attempt is made by Hunter ¹⁵Aug. to unravel the tangled ideas upon this subject. In an elaborate article he discusses and answers affirmatively the question: "Is pernicious anæmia a special disease?" In the various symptomatic anæmias, such as those of plithisis, Bright's disease, cancer, etc., the blood changes are, he says, "primarily referable to defective nutrition, to failure in *hæmogenesis*; in pernicious anæmia the changes in the blood are essentially *hæmolytic*. They are due to excessive destruction of the blood, while hæmogenesis is so little interfered with that it is generally in excess of the normal." In a later communication Hunter ⁶Sept. 22, 29, Oct. 6 gives full details of his investigations, which were both anatomical and experimental, of the pathology of pernicious anæmia, and concludes with the following *summary of results*: "1. Pernicious anæmia is to be regarded as a special disease, both clinically and pathologically. It constitutes a distinct variety of *idiopathic* anæmia. 2. Its essential pathological feature is an excessive destruction of blood. 3. The most constant anatomical change to be found is the presence of a large excess of iron in the liver. 4. This condition of the liver serves at once to distinguish pernicious anæmia post-mortem from all varieties of *symptomatic* anæmia, as also from the anæmia resulting from loss of blood. 5. The blood destruction characteristic of this form of anæmia differs both in its nature and its seats from that found in malaria, in paroxysmal hæmoglobinuria, and other forms of hæmoglobinuria. 6. The view can no longer be held that the occurrence of *hæmoglobinuria* simply depends on the quantity of hæmoglobin set free. 7. On the contrary, the *seat* of the destruction and the *form assumed by the hæmoglobin* on being set free are important conditions regulating the presence or absence of hæmoglobinuria in any case in which an excessive disintegration of corpuscles has occurred. 8. In paroxysmal hæmoglobinuria the disintegration of corpuscles occurs in the general circulation and is due to a rapid dissolution of the red corpuscles. 9. In pernicious anæmia the seat of disintegration is chiefly the portal circulation, more especially that portion of it contained within the spleen and the liver, and the destruction is effected by the action of certain poisonous agents, probably of a cadaveric nature, absorbed from the intestinal tract."

This contribution of Hunter is one of the most important that has

ever been made to the pathogeny of this obscure disease ; nevertheless, the hypothesis that the resorption of products of fermentation and decomposition in the stomach and intestinal canal might give rise to pernicious anæmia had not only been previously published, but a treatment based upon this hypothesis had been successfully carried out. The case in question, reported by Paul Sandos,³⁹ June was a female, aged thirty-one, with all the typical symptoms of pernicious anæmia, including irregular fever and retinal apoplexy. The idea of washing out the stomach was probably suggested by the breath of the patient, which is described as most offensive. The fever ceased entirely after the first lavage, and a continuance of this treatment speedily resulted in a cure.

Roosevelt⁵⁹ Apr. 14 also, in speaking of the long-continued gastro-intestinal disturbance which has preceded and been associated with so many cases of pernicious anæmia, says : “ In view of this, is it not possible that some of the cases are the result of poisoning by substances produced in the gastro-intestinal tract ? ” Finally, Trechsel¹⁹⁷ June 20 suggests that in pernicious anæmia ptomaines capable of destroying the blood may be formed in the intestinal canal.

Symptoms.—Jaundice occurring in the course of pernicious anæmia is noted by several observers. Bristowe,² June 2 reports four such cases. In none of them was there any discoverable disease of the liver, but the spleen was enlarged in all, which fact causes the reporter to adopt the view that the disintegration of effete red corpuscles, which, according to physiologists, is a normal function of the spleen, was in these cases carried to excess, more hæmoglobin being discharged into the blood than could be got rid of by normal physiological processes. Guitéras,⁹ June 23 reports a case of pernicious anæmia with jaundice in which the spleen at autopsy was one-half larger than the usual size, of dark-purplish color and firm consistence. In addition, there was a “ large serpiginous ulcer involving the right groin and portion of the scrotum.” The diagnosis was complicated by the fact that the man was a mulatto. A very similar case is reported by Julius Bartels.⁴ Jan. 16 The patient was a soldier, previously healthy, who, when first examined, had an ulcer the size of a dollar at the junction of middle and lower thirds of left leg. Proglottides of *tænia solium* having been observed in the stools, a decoction of the bark of pomegranate root was administered. This brought away two metres of the worm, but the head

was not found. The day after the anthelmintic was given jaundice appeared, and continued from July 19th until August 3d, when it ceased, to return again the beginning of September. Fragments of *tænia solium* reappeared in the stools about November 1st, when *extr. filicis maris* was given, and the entire worm expelled. The spleen in this case extended three fingers' breadth below the left, and the liver two fingers' breadth below the right costal border. Bartels regards the first attack of jaundice as due to gastro-duodenal catarrh caused by the anthelmintic and the second as hæmatogenous. The stools in the latter were always colored with bile; no bile acids could be found in the urine, and the ductus choledochus was found pervious at the autopsy.

In both the last-mentioned cases the examination of the blood was incomplete, there being no record of the number of cells or the percentage of hæmoglobin—most important data in the diagnosis of this disease—and in neither of them is the question of syphilis even mentioned. They both appear to me to belong rather to the category of splenic anæmia, for, although the fact appears to be known to very few, a splenic anæmia of pernicious type is as well established as a splenic leukæmia.

An undoubted case of pernicious anæmia, complicated with jaundice, is reported by Roosevelt.⁵⁹ At the autopsy "three small facettèd calculi composed of inspissated bile were found in the gall-bladder."^{Apr.14}

Redtenbacher⁸¹ reports a case of pernicious anæmia complicated with *local jaundice*. The yellow staining was limited to the toe-nails, especially those of the great toes, which were of a citron-yellow color.^{Apr.2}

Nervous symptoms are, as a rule, no more prominent in pernicious than in other forms of severe anæmia. It is, therefore, doubtful whether it is safe to conclude that a paraplegia, or other paralysis, occurring in the course of this disease, is dependent solely upon an insufficient supply of blood to the spinal cord or other nerve-centre.

Edes⁶¹ reports a case of severe anæmia (one million five hundred and seventy-five thousand red corpuscles to the cubic millimetre) in the course of which paraplegia, or, rather, paraparesis, suddenly occurred, and attributes the loss of motion to anæmia of the cord.^{May 26}

In the absence of an autopsy it is not quite clear why hæmorrhage is excluded as the cause of the paralysis. The patient was a male, aged seventy-one. Trechsel¹⁹⁷_{June 29} reports the case of a young woman, very anæmic during gestation, who had a normal labor without much loss of blood. The anæmia continued, and little by little she lost all power of motion in the lower extremities. The case shortly proceeded to a fatal termination, but an autopsy could not be obtained. The color of the blood was 20 per cent. of the normal. The corpuscles were not counted.

The other symptoms of pernicious anæmia are, as Coupland puts it in the Gulstonian lectures of 1881, "those of simple anæmia aggravated and intensified."

Treatment.—When there are signs of marked gastric disturbance, the example set by Sandos³⁹_{June} of washing out the stomach may be followed.

Affleck³⁶_{May} reports a case with every symptom of pernicious anæmia except retinal hæmorrhage, which was cured by iron, arsenic, and strychnia. What preparations of these drugs were used and in what doses they were given is not stated. Before treatment the corpuscles numbered seven hundred and ninety thousand, and afterward three million three hundred thousand per cubic millimetre.

There is a general consensus of opinion as to the value of arsenic in this disease, although I have seen no marked benefit from it in at least nine cases that have been under my care. Suckling⁶_{Sept.} reports a case in which it was of no benefit whatever, and refers to several others in which he had a similar experience. Inhalations of oxygen have been used, but thus far with no particular advantage. On theoretical grounds nothing is to be expected from such a method of treatment, for the blood-corpuscles, few in number though they be, are well charged with hæmoglobin and, consequently, with oxygen. In chlorosis the case is different, and benefit may be expected from oxygen inhalations in that affection.

LEUCOCYTHÆMIA.

Pathogenesis.—There has, probably, never been a more minutely studied case of leucocythæmia than the one reported by Sticker,¹¹⁴_{Bd.34, H.1,2} in which the absolute and relative maximum of white cells was greater than in any previously observed. The

former was three million seven hundred and forty-three thousand per cubic millimetre; the latter, 1 white to 0.5 red. Tissue metabolism, as represented by the excretion of urea and uric acid, was decidedly increased and ran a parallel course with the increasing cachexia. Although urea and uric acid were always both in excess, there was no constant relation between their respective amounts. Careful and repeated examinations demonstrated that an increase of the number of the white was accompanied with a diminution of that of the red corpuscles, and *vice versâ*. With reference to its volume, the blood of leucocythæmia is in marked contrast to that of pernicious anæmia. In the case of Sticker, the increased tension of radial and carotid arteries, the loud aortic-valve sound, and the fullness and tortuousness of retinal arteries and veins, pointed unmistakably to a condition of plethora which Sticker considers hydræmic. On the other hand, v. Bamberger,⁸_{No. 14} who has often observed dilatation of the heart-cavities and abnormal fullness of the vessels in the bodies of those who have died of leukaemia, is doubtful as to the hydræmic nature of this plethora. In a patient recently under his care, he withdrew, by venesection, a small quantity of blood, of which the analysis gave the following figures: Solid residue in one thousand parts = 233.90; the normal figures, according to C. Schmidt, being 212.29. In this case, therefore, the plethora was certainly not hydræmic. Notwithstanding the increase of its solid constituents, the specific gravity of this specimen of blood was only 1.0487, the normal being 1.056–1.059. This is due to the comparatively low specific gravity of the white cells, which were present in large amount. For such conditions the term *leukæmic plethora* is certainly appropriate.

Mayet,²¹¹_{Apr. 1} from a careful study of the blood, in a single case, concludes that leucocythæmia is characterized by an exuberant production of imperfect white cells, of which but a fraction attain the normal development. In the case in question, nine-tenths of the leucocytes were composed of these elements, which are soft, hyaline, and so transparent that they are often difficult of detection. They vary in size from twelve to eighteen μ , and in developing become smaller, granular, and possessed of amœboid movement. Their nucleus is extremely faint and only becomes plainly visible after treatment with various reagents. As to the so-called nucleated red corpuscles seen in leucocythæmic blood by

Neumann, Bizzozero, Löwit, and others, Mayet regards them as white cells which have devoured the *débris* of red. Certain spherical bodies aggregated in masses, resembling the so-called hæmatoblasts but less transparent, Mayet regards as possible micrococci or spores. He believes that, *à priori*, the genesis of this disease is best accounted for by a deviation of nutrition due to a lesion of the great sympathetic, or by the action of a micro-organism, and of the two hypotheses he prefers the parasitic.

The most remarkable view yet announced concerning the nature of leucocythæmia is that of Bard,²¹¹_{Feb. 12} who regards this disease as cancer of the blood. The anatomical characteristic of leucocythæmia, the enormous increase of the leucocytes, is identical with that of cancer in general, which consists of a rapid, progressive, and indefinite proliferation of the cells of the tissue affected. The lesions of spleen, marrow of bones, etc., he regards as secondary, and states that the cellular elements of these bodies are entirely distinct from the white cells of the blood. The view is ingeniously supported, but is sadly wanting in facts. For example, the statement that the increase of the white cells in leucocythæmia is always progressive ("*toujours progressive*") is notoriously incorrect, and is disproved by the case reported by Sticker,¹¹⁴_{Bd. 14, H. 1, 2} in which the proportion of white to red corpuscles varied between one to 0.5 and one to one hundred and thirty-two, the latter figures being obtained at a later stage than the former.

Symptoms.—Hæmorrhage, generally in the form of epistaxis, was a prominent symptom in most of the cases recently reported. Sticker's patient lost fifteen hundred cubic centimetres of blood in the course of six days. In a case reported by Potain,¹⁰⁰_{May 17} there was hæmorrhage from the bowels, as well as gingival hæmorrhage from the neighborhood of a carious tooth. Wacquez,²²⁰_{May 15; June 8} reports the case of a girl, four years of age, who had epistaxis, black stools, and otorrhagia. In addition there was extravasation of blood into the tissues of both lower eyelids. In a case under the care of Hale White,⁶_{June 9} a hæmatoma suddenly developed in the right axilla, and extended downward to the sixth rib and from the nipple to the vertebral groove. At the necropsy a large effusion of blood was found on the left side beneath the serratus magnus. It was imperfectly clotted and amounted to twenty-four ounces. In a case reported by Knipp,¹⁰⁴_{Nov. 17} epistaxis was the cause of death, and

in another reported by Sheawin²⁶⁷ fatal hæmorrhage from the bladder followed the passage of a catheter. Minute hæmorrhages into the brain substance were the cause of death in a case reported by Virchow.⁴¹ In the cases of Wacquez,²²⁰ and Devos,²⁸⁸ the splenic hypertrophy was associated with general enlargement of the lymph-glands, the cases coming under the head of lienolymphatic.

Priapism was a prominent symptom in Sticker's case. At first occurring only at night, it soon became continuous, and lasted, with short intermissions, for a period of seven weeks. Potain¹⁰⁰ refers to a case under his care in 1879, in which this symptom lasted from fifteen to seventeen days. The facies of leucocythæmic patients is often very deceptive, and lends weight to the theory that the condition of the blood is one of plethora—*leukæmic plethora*. Sticker's patient had a bright color ("*eine lebhaftere Färbung*"), and Delafield⁶² reports the case of a man whose lips and skin were of "good color."

Treatment.—The wonderful improvement in Sticker's case, apparently caused by the inhalation of oxygen, warrants the further employment of this measure in leucocythæmia. This method of treatment was first employed by Kimberger⁶⁹ in the case of a boy, ten and a half years old, with a considerably enlarged spleen and a proportion of one white to ninety red corpuscles. As the red were diminished, the increase of the white was partly relative. The condition, whether a mere leucocytosis or a genuine leucocythæmia, was cured by oxygen inhalations.

The therapeutic value of arsenic, a drug generally recommended in leucocythæmia, has never been thoroughly tested by repeated examinations of the blood during its administration. An attempt of this sort has been made by Barton,⁸⁰ but the experiment was interfered with by intercurrent attacks of boils, facial erysipelas, and carbuncles, the last causing considerable hæmorrhage. Nevertheless, in the case in question a marked diminution in the number of the leucocytes corresponded with large doses of arsenic, and a decided increase with their cessation. "On admission the blood contained 38 per cent. of red corpuscles, with one white to 2.5 red; on his discharge it contained 46 per cent. of red corpuscles, with one white to four hundred red." The spleen, which had been enormously enlarged, became much reduced in size while the

patient was taking arsenic. The preparation used was the liquor arsenicalis, which was pushed to the point of toleration, the dose at one period amounting to twenty-five drops four times daily. "As a result of the administration of arsenic, the skin was found to be growing darker, until he became quite bronzed, the pigmentation being more marked over the belly and gradually fading over the chest." It was especially intense over various bony prominences, such as the tuber ischii and prominences of the scapulæ.

THE SPLEEN.

Anatomy and Physiology.—Denys, of the University of Louvain,⁵²_{v.2} publishes a preliminary note on (1) the structure of the splenic pulp and (2) the normal destruction of red globules in that organ. He holds that there is no such thing as *adenoid tissue* in the spleen, of which the pulp, he says, is composed of a system of lacunæ freely communicating and traversed in every direction by a system of anastomosing trabeculæ. The blood, after traversing the capillary net-work of the Malpighian bodies, enters this "capillary cavernous" system, in which its course is greatly retarded and from which it finds its way into the splenic veins.

In accordance with Neumann, and contrary to the views of Quincke, Denys holds that, under normal circumstances, cells containing red corpuscles are very scarce in the splenic pulp, but that it contains a large number of red corpuscles in all stages of destruction. The majority of these corpuscles are free in the cavernous system, while a small number, "in certain animals," occupy the interior of endothelial cells. The work of Denys was referred to a commission which reported, through Van Bambeke,⁵²_{v.2} that its first part adds little or nothing to our knowledge of the structure of the splenic pulp, but that the second might be considered a useful contribution to our knowledge of the rôle of the spleen in the destruction of the red corpuscles.

An elaborate study of the spleen under conditions of venous hyperæmia has been made by N. Sokoloff,²⁰_{Ed.112,H.2} who contends that the theory of an intermediate circulation is untenable and that the blood in the spleen, as in general elsewhere, flows through closed vessels. The appearance of large numbers of red corpuscles in the reticular pulp-tissue he holds to be invariably pathological and always associated with considerable swelling of the organ.

The conclusions of his experiments upon animals, dogs and rabbits, are that (1) in venous congestion of short duration gaps between the endothelial cells of the splenic-pulp veins may be plainly recognized, and (2) through these gaps the red corpuscles make their way into the splenic pulp.

These experiments of Sokoloff were performed with the greatest care and skill, and the technique of the microscopical preparations of the congested spleens seems to be beyond criticism. The paper in which they are described is illustrated with numerous excellent plates.

Rupture.—The transition from the consideration of hyperæmia to that of rupture of the spleen is a natural one. Baralier⁹_{Oct.29} “concludes that it” (spontaneous rupture) “is most likely to occur in the earlier stages of malarial poisoning, when the spleen is suddenly inflamed and the seat of great vascular engorgement.” The writer⁶²_{June 15} observed a spontaneous rupture of the spleen in the course of typhoid fever. The seat of rupture was at the lower border of the organ, which was “nearly twice the normal size, soft, friable, and greatly congested.”

Tumors.—The diagnosis of splenic tumors is sometimes attended with great difficulty. Von Dittel²²_{Apr.12} reports the case of a woman, aged twenty-four, whose abdomen was opened for the purpose of removing what was supposed to be a displaced and degenerated right kidney. During life, a tumor the size of a man's fist could be felt above the right Poupart's ligament which in shape resembled an enlarged kidney. At the autopsy (the woman died during or immediately after the operation) the tumor was found to fill the lesser pelvis, and from it there extended toward the left hypochondrium a cord resembling the funis umbilicalis, which contained a large vein. The error in diagnosis is not surprising in view of the fact that hæmaturia had been among the symptoms. Both kidneys contained several abscesses. In the diagnosis of splenic tumors Mosler⁶⁹_{July 12} lays stress on the following points: 1. The presence of one or more distinct notches in the anterior border of the growth. 2. A peritoneal friction, perceived both by touch and hearing. This can only be elicited when the organ is more or less movable. 3. In rare instances, vascular murmurs. For the production of the latter it is necessary that the tumor be of soft consistence.

Drasche³¹⁹_{No. 26} reports a case of *pulsating tumor* of the spleen, making the sixth on record. Five of the cases occurred in individuals with aortic insufficiency and the sixth in one with hypertrophy of the left ventricle uncomplicated with valvular lesion. In all six of the cases, while the phenomenon lasted, there was fever from typhus, intermittent, pneumonia, and pericarditis. The conditions giving rise to pulsation of the spleen are abnormal blood pressure, consecutive to hypertrophy of the heart, and febrile relaxation of the vessels.

Casanova and Poulet⁹¹_{Mar.} report a case of bilocular hydatid cyst of the spleen in a woman twenty-three years old who had lived in Algeria since her fourth year. An exploratory puncture was made, Potain's aspirator being used, but no fluid could be withdrawn. On cleaning the cannula, a portion of membrane was found which was recognized as part of a hydatid cyst. A few weeks later night-sweats and hectic fever set in. The cyst was laid open, emptied of a large quantity of pus, and drainage tubes inserted. The patient, who was in an early stage of pregnancy, made a rapid recovery. After a careful examination of the literature of the subject, the reporters of this case succeeded in finding only thirty-two cases of hydatid cyst of the spleen, and, according to Jon. Finsen, of Iceland, the spleen is the seat of the parasite in but 0.78 per cent. of all cases.

Extirpation of a leukæmic spleen was performed by Tiri-fahy,²⁸⁸_{Feb. 26} the patient being a young woman aged twenty-two, who died the next day from capillary hæmorrhage. The spleen was thirty-two centimetres long.

THROMBOSIS.

The question of thrombosis is identical with that of intravascular coagulation, and is one of the most intricate with which pathologists have to deal. Since the elaborate paper of Welch¹¹⁷⁷_{v. 13} much has been added to the literature of thrombus formation, although it is doubtful whether we are nearer a solution of this difficult problem. Eberth and Schimmelbusch⁵⁴_{May 1} review the experiments of Naunyn, Schiffer, Högyes, Plösz and A'Gyorgyai, Landois, Armin Köhler, and others, and arrive at the conclusion that it is possible, by injecting into the blood-vessels lake-colored blood, solutions of hæmoglobin, bile salts, ether, and other sub-

stances, to produce more or less extensive coagula, but that in a number of instances the injection of these substances will be followed by no such results. Their own experiments were performed on dogs, and consisted in the injection into the vessels of lake-colored blood of the same animal and of the sheep of ether, pyrogallic acid, particles of cork, and Wooldridge's albumen infusion obtained from the thymus gland. The only positive results followed the injection of ether, pyrogallic acid, and cork filings. The experimenters, therefore, conclude that the more destructive an agent is to the blood and the vessel-walls the more certainly will coagulation follow its introduction into the circulation. To attribute such coagula, as do Schmidt and his followers, to the action of a ferment, either introduced into or formed in the blood, is, in their opinion, unwarranted.

Löwit⁵⁴_{May 15} agrees with Eberth and Schimmelbusch that the blood-plaques are essential elements of a thrombus in warm-blooded animals, but denies the existence of these bodies in normally circulating blood. He claims, by means of solutions of common salt of varying strength, to be able both to prevent their formation and to manufacture them at will. He regards the blood-plaques as precipitated globulin, and believes that they have their origin in the white blood-cells. One of the difficulties which the adherents of an exclusive plaque theory of thrombosis have to meet is that in the blood of birds, amphibia, reptiles, and fishes there are no plaques, and yet in these animals there is no difficulty in causing a thrombus by wounding the vessel-walls. It is true that in the animals just mentioned certain spindle-shaped, nucleated, colorless cells behave in the same manner as the plaques of mammalian blood, *i. e.*, when a vessel-wall is injured they adhere to the point of injury and form thrombi. On account of these and other points of resemblance with the plaques, Eberth and Schimmelbusch and Bizzozero regard them as identical with the latter. Their points of difference, among which the possession of a distinct nucleus is the most conspicuous, are, however, greater than those of resemblance. Others regard these spindle cells as undeveloped leucocytes, a view upheld by Löwit, who has seen them acquire a globular shape and distinct amoeboid movements. He has also observed their migration through the vessel-walls.

In cold-blooded animals, according to Löwit, thrombi are composed essentially of leucocytes.

The three essential constituents of thrombi are blood-plaques, leucocytes, and fibrin, which make their appearance in the order mentioned, the proportion in which they are present being largely dependent upon the age of the thrombus. Authorities are generally agreed that in its earliest stage an experimental thrombus is composed of blood-plaques alone. In cold-blooded animals, as already stated, thrombi are composed exclusively of leucocytes, and according to Welch¹¹⁷⁷_{v.13} there is "every reason to believe that some human thrombi are composed from the beginning essentially of leucocytes." The third constituent of thrombi is fibrin, and, according to Foà and Carbone,⁵⁴_{Aug.15} thrombi may be composed exclusively of this substance. They inoculated rabbits with *diplococcus pneumoniae*, which caused the death of the animals in a few days. On section they found the spleen much enlarged, hard, elastic, and of a dark-red color. These changes in the spleen were found to be caused by a coagulum which filled the entire venous system of the organ. Examined by Weigert's method, this coagulum was found to be made up exclusively of fibrin, in the meshes of which neither blood-plaques, nor red or white corpuscles could be detected.

From the foregoing it would appear that a thrombus may be composed exclusively of either one of the three constituents, which, in the great majority of cases, are found in combination.

For an elaborate and able review of present doctrines of thrombosis, the reader is referred to the article of von Kahliden.³⁴_{Aug.21}

TRANSFUSION.

Death from hæmorrhage, experimentally induced in an animal, is preceded by general tetanic convulsions. When this symptom has appeared, life can only be saved by the transfusion of unaltered blood. The transfusion of defibrinated blood or of saline solutions can, under these circumstances, only produce a temporary improvement. The above conclusions are the result of Hayem's experiments¹⁴_{Sept.19} on animals. The same author admits that in the human subject a condition in which the transfusion of unaltered blood will alone suffice to save life is extremely rare.

The following methods of transfusion are those at present employed :—

1. Intravascular transfusion—(a) of blood, entire or defibrinated; (b) of saline solutions.

2. Transfusion into lymph-spaces—peritoneum, pleura, subcutaneous connective tissue—(a) of blood, entire or defibrinated; (b) of saline solutions.

3. Autotransfusion, which means the forcing of blood to the trunk by pressure applied to the extremities.

In the opinion of the best authorities there is, as already stated, an extreme degree of acute traumatic anæmia, in which the intravascular transfusion of entire blood will alone suffice to save life. Even in these cases, however, when a blood-giver cannot be immediately procured, or when the urgency of the case is not at first appreciated, valuable time may be gained by the transfusion (intravascular) of a saline solution of defibrinated blood. The adoption of this measure will not interfere with the subsequent transfusion of entire blood; on the contrary, it may be the only means of making such transfusion possible.

Peritoneal transfusion, first suggested by Ponfick,¹⁴_{Sept. 96} has been performed about thirty times, and is not to be recommended. The only interest it possesses is physiological. By injecting the blood of a dog into the peritoneum of a kid, Hayem was able to demonstrate that the corpuscles of the former animal are absorbed as such into the blood of the latter. The much greater size of the dog's corpuscles renders their detection in kid's blood a very easy matter. Pleural transfusion has been performed, but is still more objectionable than peritoneal.

Subcutaneous transfusion is more generally applicable than any other method, and was, so far as is known, first employed by Buchanan, of Glasgow,³²_{Sept.} forty years ago. The fluid used by him was a saline solution. Von Ziemssen's method of injecting defibrinated blood beneath the skin has been employed by Marcus Hirsch,⁴_{Sept. 21} in three cases. The first case, one of severe anæmia, was cured by a single operation at which one hundred cubic centimetres ($3\frac{1}{2}$) defibrinated blood were injected. The other two, which were in their nature fatal, were much benefited by the procedure.

Kuntzen, of Munich,³⁴_{Mar. 1, 13} believing that the disasters caused by the transfusion of alien blood might be due to other substances than hæmoglobin, experimented on animals, rabbits and pigs, with a pure preparation of hæmoglobin. The results being favorable, he

twice injected the same preparation beneath his own integument, the amount of hæmoglobin injected at the second experiment being 1.5 grammes. A certain amount of pain at the site of transfusion—the thigh—which might have been avoided by rest, fever (38.5° C.), and a restless night were the only unpleasant consequences of the operation. The urine contained neither albumen, sugar, hæmoglobin, nor urobilin. The only precautions observed were of an antiseptic nature. After the injection, Kuntzen walked a good distance and delivered a lecture the same afternoon. A decided step will be gained if, as these experiments indicate, a *pure* preparation of alien hæmoglobin can be transfused beneath the skin with impunity.

In many cases there is an indication for *diluting* the blood, which is best met by the subcutaneous injection of saline solutions. Stacey Wilson, of Birmingham, ³²_{Sept.} reports several cases in which this measure was employed with palliative results. The only apparatus necessary is a funnel raised two feet above the bed, a rubber tube, and a large-sized hypodermic needle. The solution employed by Wilson was .78 per cent. of common salt—*i.e.*, sixty-eight grains (4.4 grammes) per pint. Strict antiseptic precautions must be observed. This measure is peculiarly applicable to the treatment of choleraic conditions.

A series of cases of acute traumatic anæmia, occurring in the practice of Siegfried Rosenberg, ²⁰_{June 2} were treated with remarkable success by means of autotransfusion. This observer lays particular stress upon the indications to be derived from the character of the respiration in cases of severe hæmorrhage. He describes three respiratory types resulting from loss of blood—a pneumotoretic, a hypokinetic, and a synkoptic. In the first, the respirations are *rapid* and *deep*, and so long as it persists there is no danger of death from loss of blood. In the second, the respirations are *rapid* and *shallow*. There are differences of opinion as to whether a saline transfusion will always save life where this type of respiration is present, but there is no doubt that valuable time may be gained by its performance. In the third type, the respirations are intermittent, *i.e.*, a few somewhat forcible and rapid respirations are succeeded by an alarming pause. In this type, transfusion of entire blood is indicated.

Morel ¹⁹⁷_{p. 40} reports a case of acute anæmia, the result of an

abortion, treated successfully by the intravascular transfusion of one and a half litres of saline solution (6 per cent. common salt), and Pregaldino⁵²_{Oct.27} reports another precisely similar (the women were thirty-eight and thirty-nine years of age respectively) treated with equal success by the subcutaneous injection of eight hundred cubic centimetres (1.69 pints) of the same solution.

The following solution is recommended for intravascular transfusion¹¹²_{Nov.}: Three fluidounces (eighty-eight cubic centimetres) of a saturated solution of tribasic calcium phosphate, with seventy-five minims (five cubic centimetres) of a 1 per cent. solution of potassium chloride.

To sum up: Intravascular transfusion, whether of a saline solution, of defibrinated or entire blood, should be employed only in cases of acute traumatic anæmia. In choleraic conditions subcutaneous injection of a saline solution is the most appropriate method. In chronic anæmias the subcutaneous injection of defibrinated blood, accompanied with energetic massage, will accomplish the best results. It is scarcely necessary to say that with every method the strictest antiseptic precautions must be observed.

SCROFULA.

Differences of opinion still exist concerning the bacillary nature of scrofula. Van Merriis¹⁸¹_{Apr.} speaks of its lesions as those of local tuberculosis, and Grancher¹⁷⁷_{Mar.12} describes scrofula as an attenuated, curable tuberculosis. On the other hand, Lartigues²⁷⁰_{June} says that, so far, bacilli have not been detected in the lesions of scrofula, while Jacobi⁵¹_{Sept.} considers the tubercle bacillus as an "accidental invasion."

The relations between syphilis and scrofula are discussed by Rabl⁸_{Oct.4} as follows:—

1. While acknowledging that scrofula is too commonly regarded as a descendant of syphilis, he believes that in not a few cases syphilis is an etiological factor.

2. Syphilis of parents or grandparents predisposes to scrofula by lessening the powers of resistance to the causes of the latter disease.

3. Syphilis of parents, besides producing the characteristic symptoms of congenital syphilis, also gives rise to symptoms identical with those of scrofula.

Eve,²_{Apr. 14} who has shown that the virus of scrofula produces visceral tuberculosis in rabbits and guinea-pigs, admits that the disease in rabbits is not so acute and rapidly fatal as that following inoculation with acute miliary tubercle, and attributes the comparatively innocent course of strumous gland disease to the soil in which the virus is implanted.

Alexander¹⁸⁷_{July} is non-committal on the subject of the etiological nature of scrofula, believing it to be "unwise to change a name in order to represent a theory (the bacillar) that may soon have to be given up as untenable." Wherever, he says, we can trace the cause of scrofula, it is "nearly always something quite different from the injection of a syringe of microbes." In view of the discrepant opinions above mentioned this attitude of reserve is undoubtedly justified.

Treatment.—In the prophylactic and curative treatment of scrofula nothing can compare with sea-air and sea-bathing. At Cannes, in the marine hospital founded by Jean Dollfus and under the care of Dr. Valcourt,⁴⁶² sea-bathing is kept up during a great part of the winter, and is only discontinued on account of the coldness of the *air*. In 1886 and 1887 it was continued until December 23d and renewed on February 17th, when the temperature of the sea was 58° F. The minutiae of the seaside treatment of scrofula are discussed by Alexander,¹⁸⁷_{July} Bouvet,³⁵_{June 7} and Cazenave de la Roche.⁵⁵_{Nov. 4, 11, 18} The latter extols the virtues of Saint Raphael, on the Mediterranean, as a winter residence for scrofulous patients. Cazin (quoted by Alexander) compares the mortality of scrofulous patients in two of the Paris hospitals with that of the hospital at Berck. In the former it was one hundred and nine in four hundred and thirty cases; in the latter, eighty-two in five hundred and fifty-four cases.

The medicinal treatment of scrofula is discussed by Jacobi⁵¹_{Sept.} and Grancher.¹⁷⁷_{Mar. 12} The principal drugs employed in this disease are cod-liver oil, iron, arsenic, and iodine. According to Grancher, cod-liver oil is only useful when it increases the appetite. Krasnogladdoff, of Tiflis,⁸⁰_{Apr.} reports several cases cured by infusion of Knight's spur (*Delphinium consolida*). William F. Gibb²¹³_{Jan.} reports four cases of "scrofulous neck," in which operative treatment was followed by marked improvement in the general health.

Dr. Eklund, corresponding editor, Stockholm, Sweden, calls

attention to the work of Admansson,³⁷¹_{v.19,p.1} in which the diagnosis and treatment of iliac glandular tumors of scrofulous nature are considered.

SCURVY.

J. Hickman¹⁵_{May} discusses the question of the occurrence of scurvy among troops and its prevention. He holds that "the occurrence of a single case shows negligence and is a reproach to the medical authorities." The means of its prevention are exclusively dietetic and hygienic, lime and lemon-juice being the best and most convenient prophylactics.

A case of land scurvy is reported by Barkas,²⁶⁷_{Jan. 15} the patient being an Australian shepherd who, for two or three weeks before the attack, had been living on tea, "damper," and salt meat. Variot, of Paris,¹⁴_{Sept. 19} reports two cases, both observed in the central infirmary of the prisons of that city. Both presented a decided degree of leucocytosis, the proportion of white to red cells being one to fifty. This seems to be an approximative estimate, as no exact count of corpuscles is recorded.

In two well-marked cases of scurvy in which the blood was examined by me,¹⁹_{June 16} the red corpuscles numbered, in the first, two million seven hundred and seventy-five thousand per cubic millimetre, and in the second one million nine hundred and eighty thousand. The white corpuscles were not increased in either case, and in the second they were not only relatively but absolutely diminished, as I examined a great many fields without finding any, and at last, after a prolonged search, succeeded in finding *one*.

Diagnosis.—The diagnosis of a case of uncomplicated scurvy presents no difficulty to one who has carefully observed a single case of the disease, but is far from easy when it occurs in the course of another affection. Under such circumstances it is doubtless often overlooked. The patient being perhaps already confined to bed, the pains on walking which are so marked in the uncomplicated cases are unperceived, while the increasing feebleness is attributed to the primary affection. Lasègue and Legroux³⁶⁰_{v.18} state, with reference to secondary cases of scurvy, that many of them would have escaped their notice but for their daily, careful search for its manifestations in *all* the patients under their care. Serous inflammatory effusions in scurvy are probably always hæmorrhagic,

and it is a question whether the converse of this proposition is not true, viz.: that a hæmorrhagic serous effusion always indicates a scorbutic condition. For my part, I am satisfied that the relation between hæmorrhagic pleurisy and scorbutus is much more intimate than that between hæmorrhagic pleurisy and tuberculosis of the pleura. Non-inflammatory effusions may be free from blood. In a well-marked case of hydrothorax occurring during convalescence from typhoid fever, a litre and a half of clear, serous fluid was removed from the right pleural sac. Lasègue and Legroux suggest a division of scurvy into two forms: a sthenic, characterized by hæmorrhagic phenomena of great intensity, and an asthenic, much less hæmorrhagic, but more cachectic form, the latter being chiefly observed in the intemperate, the destitute, and the aged. This does not correspond with my experience, in which, without exception, the greatest cachexia coincided with the greatest hæmorrhage.

HÆMOPHILIA.

The most remarkable family of bleeders of which we have any account is the one living in Teuna, a village in the canton of Graubündten, whose genealogy has been traced by Anton Hoessli.¹¹⁴_{Bd.15, H.3} It springs from a couple of the same name, presumably relatives, who lived nearly three hundred years ago—in 1640. Hæmophilia is thus proved to be the most hereditary of all diseases.

Cases are reported by Carson,⁴⁰_{Oct.} Rohé,¹⁰⁴_{Nov.24} Bailey,¹⁹⁸_{May} Delafield,¹⁹_{Feb.19} Pye-Smith,²_{Apr.7} Vincent,²_{Apr.14} and McArthur.²_{Apr.14} Fürth⁵⁷_{Sept.16} believes hæmophilia to be most common in people of Israelitish descent, but gives no figures in support of this statement; nor does he stop to discuss the question whether this supposed predisposition would not vanish if all children were exposed to the traumatism which is an integral part of the Jewish ritual. In a twelve-year-old boy whose five brothers and sisters had died of hæmophilia, recovery ensued under treatment with fluid extract of *hydrastis canadensis*, thirty drops daily. The treatment was continued for about four weeks, when the hæmorrhages (epistaxis and subcutaneous extravasations) ceased, and had not returned at the end of eighteen months.

According to Hayem,¹⁴_{Sept.26} the best hæmostatic is the transfusion of *entire* blood, of which but a small quantity will sometimes stop

an otherwise uncontrollable hæmorrhage. He believes that it acts by supplying those elements, the hæmatoblasts, which are so active in the formation of thrombi.

DISEASES OF THE THYROID GLAND.

By CHARLES E. SAJOUS, M.D.,
PHILADELPHIA.

THE editor of the ANNUAL found it necessary to prepare this review at the last moment, Dr. Guitéras, the associate editor of the department, having failed to furnish it. Inquiry eliciting the information that he had sailed for Europe, it is surmised that he mailed the article to the central department just before his departure, and that it was lost. This is rendered probable by the fact that the very full collection of clippings furnished Dr. Guitéras was not returned by him so as to enable some one else to prepare the article. Should his contribution finally appear, it will be published *in extenso* in the SATELLITE.

PHYSIOLOGY.

At the Congress of Italian Surgeons, Ceci referred to a girl in whom extirpation of the spleen was followed by marked swelling of the thyroid gland. Cardone,⁴⁶¹_{Pt.4} reports two analogous cases observed by him, in both of which hypertrophy of the spleen coincided with an increased volume of the thyroid gland. In Professor Ceci's case the spleen was removed; in Cardone's cases the functions of the spleen were equally destroyed by disease. Cardone argues that the hypertrophy of the thyroid is in relation with the abolition of the function of the spleen. Physiological experiment and the clinical results of extirpation of the thyroid demonstrate the importance of this gland as a hæmopoietic organ, and hence the author is inclined to admit that when its function is abolished an organ possessing analogous functions, such as the spleen, may become hypertrophied. In this manner, also, those cases of total extirpation of the thyroid not followed by cachexia may be explained.

Rudinger¹¹_{Apr} at the Medical Congress, of Munich, basing his opinion upon the fact that thyroidectomy induced myxœdema, diminished mental capacity and caused cretinism, concludes that

the thyroid gland has a great relation to the nourishment of the central nervous system. Interesting in this connection are the results of an examination of forty thyroids taken from patients dying in Guy's Hospital by Hale White,¹¹_{Sept.} which showed that atrophy of the gland did not invariably produce myxœdema, even when atrophy was complete.

GOITRE.

Etiology.—An essay on the etiology of goitre, which deserves special attention on account of its thoroughness and the evident care with which the observations described in it were conducted, was published by Vetlesen, of Hamar, Norway,¹²¹² and admirably abstracted by Dr. Holger Mygind.¹¹_{Mar.} In one hundred and seventeen families in which one or more members suffered from goitre, all patients observed living in the town of Hamar and its environs, where the disease is frequently met with without being endemic, the disease had most frequently commenced in childhood, and rarely after the age of forty. In comparatively few cases the development of the goitre could be traced back to puberty or gravidity. In no less than seventy-four of the one hundred and seventeen families several individuals suffered from goitre, and in forty-eight of these the disease appeared in the direct ascending or descending line, while it appeared only in the lateral branches in but twenty-six cases. Hemiparesis, and this only in its typical form, where it has all the signs of a neurosis, was a symptom very frequently met with—both in the patients with goitre and—and this was more frequently the case—in their relations with no goitre. To show how hemiparesis and goitre occur alternately in a family, the author quotes a case where the grandmother had hemiparesis but no goitre, the mother has goitre without attacks of hemiparesis, while of her two daughters, who both suffer from goitre, the one also suffers from hemiparesis, while the other one is free. Altogether, the author quotes seven most interesting genealogical tables, showing the heredity of goitre, especially in the direct line, and its close relationship to hemiparesis, which the author does not consider as resulting from a mechanical pressure of the thyroid gland, but as a co-ordinate symptom of disease of the vasomotor system. Three patients out of the one hundred and seventeen families suffered from Basedow's or Graves' disease. A very large number of the

patients observed suffered from anæmia. There was also found in several cases a marked hæmorrhagic tendency, this occurring more frequently in individuals with no goitre. In one family four females had goitre and five suffered from menorrhagias, which in one case resulted in death under the author's treatment. There were found thirteen cases of mental disease and four cases of deaf-mutism.

The author considers goitre as being of vasomotor origin, as put forth by Woakes, and sees a corroboration of this theory in the fact that in the families with goitre observed by him, other diseases, which could also be ascribed to vasomotor disorders, occurred very frequently.

Treatment.—In a case of large cystic goitre, in which Fletcher Ingals, of Chicago,⁴⁶² could not obtain the consent of the patient to apply irritating fluids externally, this observer drew off the fluid by means of a trocar and cannula, six inches of catgut steeped in tincture of iodine being then introduced through the cannula. When the instrument was removed, a small piece of the catgut was left, its end projecting from the opening. As soon as there were symptoms of local inflammation the gut was removed and a compress placed over the region of the cyst. There was very little annoyance and no return of the enlargement. In the course of the discussion that followed, Stockton, of Chicago, stated that he had used injections of pure carbolic acid, five minims (0.33 gramme), with considerable success.

Referring to treatment by puncture and injection of iron, Thorton, of Canterbury,^{6 Feb. 18; 11 Aug} recommends the substitution of rubber for metal cannulæ on the third or fourth day, so as to do away with the risk of irritating the walls of the goitre.

Vachell, of London,^{131 Dec. '87} treated a case of cystic goitre, in a woman of twenty-two years, by what he terms "shelling out." An exploring needle having been introduced, it was ascertained to be a single cyst and to contain a reddish fluid. The cyst was "shelled out" without any difficulty through an incision about two and a half inches long over its most prominent part. Two vessels required ligation. The tumor weighed eleven and a half ounces and contained five and a half ounces of fluid. The patient made a good recovery. The writer states that hæmorrhage is the chief source of danger in this operation, but in the case reported no trouble was experienced on that account.

At a meeting of the Medical Society of London, Stoker²²_{Nov. 28} showed a case in which a goitre had disappeared during a course of treatment with the galvano-cautery, applied to the turbinated bones for hypertrophic rhinitis. He attributed the cure to the reflex irritation of the vasomotor system by repeated cauterization *via* the fifth nerve.

Whitehead, of Manchester,⁶_{Mar. 10}; ¹¹_{Nov.} expresses a strong preference for excision of the thyroid in all cases where surgical interference is imperative, and condemns all less radical treatment, such as puncture and injection of irritating fluids. In operating, he warns the surgeon not to be misled by the thyroid muscles which are found stretched over the gland and very much altered in character. He advises to carefully divide layer after layer until the capsule is reached, the vessels being the best guide, and to secure each vessel separately, then dividing it between two ligatures. The thick attachments of the tumors ought to be thinned by a process of "teasing" with a blunt instrument. When suffocative symptoms develop, the isthmus may be either divided or removed. The surgeon who is deficient in confidence may effect either of these by Paquelin's cautery. The treatment after excision is simply free drainage and immobility of the head for the first four days, the tissues being brought together by iron sutures and a large perforated rubber tube introduced. Harsant¹³¹_{Dec.} is opposed to cutting operations unless dyspnoea, dysphagia, or aphonia exist. Morris, of London,⁶_{Sept. 24}; ¹¹_{Jan. '88} reports a case of goitre treated by excision. "The object in putting the case of thyroidectomy on record is because now, at the end of three years, the girl is in good health, and shows no sign whatever of any threatening of myxoedema."

Buman¹⁹⁷_{Nov.} reported the successful excision of an enormous cystic goitre. He had found drainage a procedure that gave dissatisfaction on account of the slowness in obtaining a cure. He thought, however, that before resorting to extirpation the age of the patient should be taken into account. Total ablation of the thyroid could certainly modify the constitution of a young subject, while it would have little influence in an older subject.

At a meeting of the London Medical Society, Borel¹¹_{Aug.} referred to the regulating function of the thyroid over the cerebral circulation, and also to the observations of Kocher, who found cretinism induced by the removal of the thyroid in very young people, the

danger being less after puberty. Welch¹¹_{Nov.} found that death invariably followed extirpation of both glands in dogs, the removal of one being alone followed by recovery and by compensatory changes in the gland remaining.

Berdez,¹⁹⁷_{Mar.} referring to the statement of Weiss that in patients in whom excision of the thyroid gland had been performed there existed a marked tendency to tetanus, presented a case in whom on the use of feeble electric currents, both positive and negative poles being placed upon the twelfth pair, severe tetanic contractions of the corresponding half of the tongue were produced either on opening or closing the current. This hyperexcitability is, according to Herzen, the rule in animals.

Mr. Lennox Browne, at a recent meeting of the Medical Society, of London,²²_{Nov. 26} showed three patients who had suffered from goitre. In two of them he had removed the isthmus, and in the third he had extirpated the isthmus and the right lobe, weighing seven and three-quarters ounces. In all three cases relief of intense dyspnœa had promptly followed. His cases gave rise to a discussion on the propriety of total extirpation of the thyroid in view of the danger of the supervention of myxœdema.

Worthington, of Colorado,⁶_{Mar. 12} alludes to a case which "was cured in a day by two applications of an ointment composed of ten grains (0.65 gramme) of mercuric biniodide to an ounce (31 grammes) of lard, each application having been followed by immediate exposure of the anointed part to the sun, as recommended by Professor Aitkin. The cure was complete and permanent."

Webster and Ruel,⁶_{Mar. 17} ¹¹_{Nov.} describe four cases in infants, in which breathing and swallowing were seriously interfered with. Spontaneous recovery or improvement took place in each case.

MYXŒDEMA.

Etiology and Symptomatology.—W. Makeig Jones¹¹_{Sept.} showed a case before the Sheffield Medico-Chirurgical Society, in which, among other symptoms, were slowness of speech and stammering; unpleasant taste, but not smell; the thyroid, especially in its left lobe, was larger than in women of the same age. Shelswell, of Mitcham,⁶_{Dec. 31, '87} ¹¹_{May} calls attention to the greater prevalence of the disease among females as compared with males, and to the fact that the hæmorrhagic tendency appears to be a feature of the malady.

Handfield Jones, of London, exhibited a case before the Harveian Society ¹¹_{Feb.} of a woman of forty-nine years, in whom severe menorrhagia, which he had observed in several cases of myxœdema, had been a prominent symptom. He raised the question as to whether the malady may not have a predisposing cause in the state of the system induced by severe and repeated drains.

Maw, of Wednesbury, England, ¹⁴_{June} recorded a case of hæmorrhagic tendency in connection with the disease, the bleeding occurring from the lungs between menstrual periods. The tendency to hæmorrhage in myxœdema is also shown in three cases reported by Arthur Davis, of London, ⁶_{Jan. 14}, and in one by Laycock ⁶_{Feb.} in which the tendency to hæmorrhage showed itself by frequent hæmoptysis. Watt, of Lawrence, Mass., ⁵⁹_{Jan. 23} reports a case in a woman presenting a marked neurotic history, and whose brother and uncle had been insane. No enlargement of the thyroid gland could be noticed. In a case reported by Tresilian, ²_{Apr. 21} absence of both thyroid gland and isthmus was observed, probably the result of atrophy. Jaccoud ²¹²_{Sept.} considers marasmus, supervening during the course of the affection, a symptom of marked importance.

ACUTE ENLARGEMENT.

Barlow, of London, ¹¹_{Apr.} showed an interesting case of acute enlargement of the thyroid gland before the London Clinical Society. The patient, a child, was just recovering from an attack of erythema nodosum, when he was taken out of doors. Slight and gradually increasing enlargement of the thyroid gland occurred, accompanied by pain, dysphagia, and fever, which yielded at the end of two weeks to leeching. Barlow concludes that, as the enlargement succeeded upon erythema nodosum, it might be considered by some as of rheumatic origin, though no other rheumatic phenomena were observed, and its severity was greater than that of the recorded rheumatic cases, the acute duration of which was not longer than forty-eight hours. The author himself is inclined to place the present case in Lucke's idiopathic group, and to accentuate its association with slight nasal catarrh, and sequence on exposure to cold when in an anæmic condition.

In the course of the discussion Dr. Stephen Mackenzie mentioned the case of a gentleman who died from sudden inflammation of the thyroid and pressure of the gland upon the trachea. Cases

of acute enlargement of the thyroid often ran a very rapid course. Mr. Berry referred to several fatal cases of acute enlargement of the thyroid, which usually occurred at or about the period of puberty. Dr. Angel Money mentioned a case of characteristic rheumatic thyroiditis occurring in a young lady. The swelling had the clinical course and characteristics of rheumatic swelling of a joint, but did not in any way resemble a goitre.

EXOPHTHALMIC GOITRE.

Etiology and Symptomatology.—R. Norris Wolfenden, of London,⁶¹_{Jan.} in a very interesting article, emphasizes the important fact that in Graves' disease the body resistance to the passage of the electrical current is lowered in a remarkable manner,—a point to which Charcot was first to draw attention. Having determined in some fifty healthy persons that the average body resistance to a moderate and fixed current will register from four thousand to five thousand ohms, he found that in some cases (two) the resistance was as low as two hundred and three hundred ohms, while in eight others it varied from five hundred to seven hundred. The author ascribes this peculiarity to "the diminished resistance of the vasomotor dilatation of the skin capillaries, which thus render the skin saturated with fluid, and practically reduce the thickness of the ill-conducting epidermis to a minimum." Shaw²⁶_{May} presents a series of forty-six cases and results quite in accord with those of Dr. Wolfenden. Charcot, in a lecture at the Salpêtrière, laid considerable stress upon diminished electrical resistance as a symptom in addition to that of tremor.

J. M. Taylor, of Philadelphia,⁸⁹_{Apr.} in a paper on the "Early Recognition of Exophthalmic Goitre," describes a series of eight interesting cases. The first symptoms observed were due to loss of nervous equilibrium. Tremor he had rarely seen, though tremulousness of the voice had been observed. The heart was rarely hypertrophied, though generally dilated, systolic bruits being often present. Von Graefe's sign was often noticed before exophthalmos, the latter being a late manifestation. Brouzing of the skin was observed in one case, albuminuria in three, and œdema of the legs in two. R. H. Lucy, of Plymouth,²_{Sept. 17} reported the association of leucoderma with Grave's disease in the case of a woman aged twenty-one years.

Pathology.—Hammar³⁷²_{Vol. 24, p. 290} reports the post-mortem examination of a woman who during life had exhibited marked symptoms of exophthalmic goitre for several years. No pathological changes whatever were found on examination of the cervical portion of the sympathetic nerve. The spinal cord was not examined. The author has found recorded twenty-two cases of post-mortem examination of the sympathetic nerve, of which fifteen gave the same result as his. An autopsy by Roosevelt, of New York,¹_{Mar. 31} showed the thyroid reduced in size, but still moderately enlarged and of a pink color. The kidneys showed a trace of fibrous tissue, but otherwise the organs were normal. There was apparently nothing abnormal in the medulla nor in the sympathetic or vagus nerves. Microscopical examination of these parts also showed nothing.

Treatment.—Lewandowski¹²³⁴ stated that he had obtained very favorable results from franklinization. He had succeeded by galvanization of the neck, as well as of the spine, and in but few sittings, in diminishing not only the goitre but the cephalalgia and sleeplessness. A. D. Rockwell, of New York,¹³⁸_{Sept.} recommends, in addition to the galvanic current: R̄ Phosphosphate of iron, bromide of zinc, āā 5 1 (4 grammes); tincture of digitalis, 5 5 (20 grammes); fluid extract of ergot, 3 4 (130 grammes). One teaspoonful to be administered three times a day. Galvanization of the great sympathetic and faradization of the cardiac region were also highly praised by Charcot in his lecture at the Salpêtrière already alluded to. He also lauded the treatment by hydrotherapy, especially the repeated application of ice-bags over the heart. Hopmann, of Cologne,¹_{No. 32} relieved permanently a case in which exophthalmos, stenocardia, and general asthenia existed (but no goitre), by the removal of nasal polypi, and curing a rhinopharyngitis from which the patient had long suffered. Iodide of potassium caused symptoms of Grave's disease, tachycardia, exophthalmos, etc., to appear in a case of Rendu's,¹⁰⁰_{May 29} who had administered the drug for acute aortitis. Souza-Leite⁷³_{Oct} reports a case in which considerable amelioration of all the symptoms took place under the influence of pregnancy. J. H. Lloyd, of Philadelphia,¹¹⁹_{Apr.} reports a case of rapidly fatal exophthalmic goitre in a woman, aged thirty-nine, who had been suffering for some hours with diarrhoea and violent vomiting. Another case was reported by Graham before the Toronto Medical Society.¹¹_{May}

URINALYSIS.

By JAMES TYSON, M.D.,

AND

ALLEN J. SMITH, M.D.,

PHILADELPHIA.

Average Composition of the Urine.—From a large series of analyses of the urines of males and females, adults, apparently healthy, Yvon and Berlioz⁹²_{Sept. 15} construct the following table of the average composition of normal urine. These results comprise the analyses of three hundred and forty-seven specimens from males and three hundred and fourteen from females:—

	Male.	Female.
Volume,	1360 c.cm	1100 c.cm.
Specific gravity,	1022.5 “	1021.5 “
Urea, per litre,	21.5 grammes.	19. grammes.
Urea, per twenty-four hours,	26.5 “	20.5 “
Uric acid, per litre,	0.5 “	0.55 “
Uric acid, per twenty-four hours,	0.6 “	0.57 “
Phosphoric acid, per litre,	2.5 “	2.4 “
Phosphoric acid, per twenty-four hours,	3.2 “	2.6 “

It is of interest to note in this connection that, regarding uric acid as a product of incomplete metabolism, tending toward urea as the final metabolite, this table in its sexual differences carries considerable confirmatory evidence. The average male, through a higher physical activity, and consequently more thorough oxidation of his tissues, should present a larger proportion of the completed product of tissue change in the form of urea and a smaller amount of the less oxidized metabolite, uric acid, than the more sedentary female, who is naturally less active and less exposed to the open air. The authors, from these analyses, conclude that the proportion borne between uric acid and urea is 1:40 in the mean result, differing from their former reckoning (1:30) and from that obtained by Alexander Haig, from cases in whom the uric acid diathesis was prominent (1:33). The relation of urea to phosphoric acid is also tolerably constant, about 8:1, according to these researches.

Quantity.—In a comprehensive paper upon the daily excretion of urine in infants and children and the variations in disease, Maxi-

milian Herz⁸⁴_{Sept. 3, 10, 17, 24} gives some interesting statistics of the relative increase in quantity from year to year in the two sexes: At eight years, the average quantity for boys is seven hundred cubic centimetres; for girls, six hundred cubic centimetres; at ten years it is for boys seven hundred and fifty cubic centimetres; for girls, seven hundred cubic centimetres; at twelve, for boys one thousand cubic centimetres; for girls, eight hundred cubic centimetres.

Arthaud and Butte²³¹_{Oct} have recently conducted experiments intended to show the relation existing between the pneumogastric nerve and the urinary excretion. These nerves, when their peripheral ends are stimulated, do not have an analogous action upon the same kidney—stimulation of the left pneumogastric in the neck of a dog causing an escape of twenty-one cubic centimetres of urine through the right ureter and only four cubic centimetres through the left. Reversing the stimulation to the right pneumogastric, the opposite was obtained. From this and other researches it would appear either that the distribution of the pneumogastric nerve is a crossed one, and its action here an inhibition of the renal vaso constrictors; or, as is more probably the case, in our opinion, that its distribution is direct and its action primarily constricting to the renal vessels with the effect of suppression of the excretion of urine from the corresponding kidney. This last view is strengthened by the action of the nerve under peripheral stimulation after section, according to these same authors, upon the biliary secretion, Arthaud and Butte having observed under these conditions a notable diminution of hepatic secretion, as well as a contraction in calibre of the deep-seated blood-vessels in the stomach.

Lépine and Porteret³_{July 18}; ⁶_{Aug 25} recently studied the variations in the urinary secretion under conditions of counter-pressure produced by ligating the ureter. They conclude that there is no relation between the quantity discharged and the degree of counter-pressure employed; that in the case of feeble counter-pressure the quantity of urea excreted is more diminished than is the quantity of water, while in case of strong counter-pressure the opposite obtains. In the case of weak pressure the relation of the chlorides is superior to that of the other salts, and *vice versa*. Phosphates, as a rule, are less easily discharged under pressure than the salts generally. In some experiments where cane-sugar had been injected into the veins in order to favor the secretion of urine the relation of the

sugar has not notably differed from that of the quantity of the urine.

Polyuria.—A number of cases throwing some light upon the causation of polyuria have been met with. Berri²⁶_{Mar.1} reports a case following several weeks after a basal fracture of the skull. The patient had apparently recovered from the effects of the accident when a simple polyuria set in and lasted until death, ten weeks later, apparently from some pulmonic trouble. On section no pathological appearances were found anywhere except in the posterior cranial fossa, where, corresponding to the seat of the fracture, there was an adhesion between the pia and cerebral structure. Buttersack,⁷⁵_{Mar.1} from Erb's clinic in Heidelberg, details a case of syphilitic disease of the brain and cord in a woman, aged thirty-one years. Besides the other and usual symptoms, there was from the first a marked polyuria, which the writer considers as dependent upon the specific cerebral invasion. In seeking among malarial cases for instances of glycosuria, Mossé¹¹_{Oct.3:}⁶_{Oct.13,20} came upon a number of cases of polyuria occurring after the febrile seizures. This polyuria is not ordinarily associated with a proportional excretion of urea, but is not a simple hydruria, in that especially where the chlorides have been given their proportion is large. In its general features it resembles the polyuria of convalescence, rather than one marking a crisis of disease. An interesting case, regarded by the author as of hysterical origin, is detailed by Souques,⁵⁵_{Mar.3} A woman, aged thirty-four years, with a history of syphilis of several years' standing, and marked hysterical tendency, in 1884 developed a sudden hæmaturia, apparently without cause, and without any general disturbance or other symptoms. It lasted two years, and then stopped as suddenly and with as little appreciable cause as it began. Last December a marked polyuria set in suddenly, apparently causelessly and without any accompanying symptoms save polydipsia. The quantity varied from thirteen to sixteen litres; specific gravity 1002—urea for twenty-four hours, twenty grammes—no albumen and no sugar. By a process of exclusion the writer reaches a diagnosis of hysterical causation. A case of reflex polyuria in the later stages of pregnancy is reported by McCullough,³⁹_{May} in which the quantity reached a total of ten pints in the twenty-four hours. It contained no albumen, no sugar, and continued with advancing emaciation of the subject

until after delivery. The patient was not hysterical, nor had there ever been a prior attack. Randall⁹_{Apr.9} reports a case in a weak, anæmic, flabby girl of eleven years, in whom, after valerian, ergot and tannic acid had been given in vain, salicylate of soda was at once followed by improvement, and within four months complete cure. Bucquoy³_{May 2} has found ergot efficacious in a case of nervous origin in a man who had developed the symptoms after having been nearly drowned at sea five years before. Grancher,⁵⁵_{June 9} Hereford,⁷²_{Oct.} and Huchard³_{Feb.29; May 2} present cases illustrating the therapeutic value of antipyrine—the first in the case of a child without taint, bright and otherwise healthy; Hereford, in a simple polyuria in his own person; Huchard, in two cases of nervous origin, and in a third with diabetic polyuria. Dujardin-Beaumetz⁷³_{May 19} has found that this agent is of value in cases of nervous origin, but without result in cases of renal causation; he has, however, found albumen in the urine after several days' administration of the antipyrine. In diabetic polyuria he found it lowered the proportion of sugar, which statement is confirmed by Robin⁸²_{June 2} and Féréol.³_{Apr.4}

Anuria.—In the case of a man forty-nine years of age, who had in his life passed renal calculi, and who for five days had been suffering from complete anuria, Israel⁶⁹_{Jan.5} decided from the existing complex of symptoms to cut down upon the left kidney, expecting to find a calculous impaction in the pelvis of the kidney or the ureter. Two stones were found in the latter part of the urinary tract and removed, after which a copious urinary excretion took place, passing both from the bladder and wound. The marked differences in constitution between these two specimens from the time of operation on until death, nine days later, showed an undoubted re-establishment of the functions of the right gland. Although at the post-mortem examination there were found in this right organ four calculi of considerable size, their location and the course of the symptoms pointed rather to a reflex or sympathetic suppression in this kidney than to a coincident mechanical suppression; and the re-establishment would in this light partake of the same nature. A case quite analogous to the above is recorded by Counsell.⁶_{May 19} A man aged fifty-five years, large, stout, and healthy, had had about a year previously an attack of renal colic on the right side, from which he presently recovered entirely, apparently. On January 15th of the present year he was attacked

with severe left-sided pain and an almost total suppression. For the relief of a seemingly strangulated hernia upon his person (with possible causal relation to the suppression and pain) chloroform was administered and several pints of urine were passed. On the 18th, the pain returned and total anuria supervened, and from this time until the 23d not a drop of urine was voided. Suddenly, without warning, on this latter date diuresis set in, and within twenty-six hours the patient had passed a total of twenty-three pints, nearly all clear, specific gravity 1012, acid reaction and no sugar, containing albumen, and on several micturitions some blood. On the 6th of February a calculus was passed, *per urethram*, measuring seven millimetres in length, and in its greatest circumference three millimetres.

In a case apparently of the same nature occurring in a man who fourteen years previously had had renal colic on the right side, and at the time of inquiry a left renal colic with more or less complete anuria for nine days, followed by polyuria, Lockwood ⁵⁹_{May 26} refers to the probability of the inactivity of the right organ being due, not to a sympathy or reflex influence, but to actual organic inability, dating back to the attack in that organ fourteen years previously. As to the polyuria succeeding these cases, the writer would not refer them to the condition of hydronephrosis, but considers the phenomenon to be due to a relaxation of the renal arterial system, brought about by the constant pressure of the pent-up urine—this relaxation uncompensated by relaxation elsewhere—and by direct stimulation of the renal epithelium by the increased urea in the blood. These conditions of filtration and excretion proper would explain by their probable continuance the length of time over which such diuresis takes place. Weber ⁵⁹_{May 26} referred to his own case as one in which complete anuria from one-sided obstruction in the ureter, followed by diuresis for some days, could not be found to be associated with any renal organic lesion.

ALBUMINURIA.

This condition has become the subject of stimulated study within the past few years, and the endeavor to establish a condition of physiological albuminuria has had the effect of producing a revulsion of opinion as to the gravity of the symptom, unless associated with other evidences of organic affection. Pepper ¹⁹_{June 9} states

that of two hundred and thirty-nine supposed cases in his practice during eight months, one hundred and forty-three were found to be albuminurics, and he concludes that the gravity of the case as indicated by the presence of albumen is frequently much exaggerated. The views advanced by Semmola⁶⁹_{p. 410, 430} as to the causation of the symptom, dividing the whole complex into two varieties, hæmatogenous and nephrogenous, are strengthened by several reports of clinical and experimental observations during the year. This author differentiates these two varieties from the following characteristics: The hæmatogenous variety is always considerable, the nephrogenous always scanty; the former answers to all tests for blood-albumen, the latter does not, and especially does not give a violet-red color with a solution of cupric oxide and potassium hydroxide; their solubilities also vary; the presence of formed elements in the urine is a marked feature of the inflammatory (nephrogenous) variety, whereas in the dyscrasic (hæmatogenous) form they are absent, or if present are not increased when the albumen is increased by albuminous diet. From a clinical study of the cachexias and pernicious swellings, Immerwahr⁵⁹_{Jan. 21} has been led to recognize a dyscrasic albuminuria, which in his experience is entirely unassociated with renal lesions; and in a thesis upon diphtheritic albuminuria, Barbier³¹⁹_{June 2} also concludes that there is a hæmatogenous albuminuria without any possible causative kidney affection. He recognizes the appearance of albumen in the urine early in diphtheria as significant of the invasion of the blood by the infectious agency of the disease, and regards the prognosis as varying with the amount and rapidity of appearance of this early occurring albuminuria. The experience of Johnson²_{Mar. 3; July 14} in relation to albuminurias dependent upon sewage poisoning also tends toward the same conclusion; he mentions five marked instances in a recent article upon the subject. Hayem,³_{Mar. 14} from a series of experiments performed upon animals, noted that albuminous liquids derived from the normal blood or some other normal source could be injected into the vessels without inducing an albuminuria and without having any renal effect. On the contrary, pathological serum or any albuminous material containing any coagulating principle, or capable of causing elemental hæmic change, was at once followed by albuminuria, hæmaturia, or some other renal functional alteration. An albuminous dyscrasia followed by al-

buminuria is known to follow the injection of egg-albumen into the hæmatic system ; but Snyers,^{17 9}_{Feb. 14; Mar. 17} from observations carried on in a series of animal experiments, reports that this dyscrasia ceases within twenty-four hours after the injection, and that the albumen is excreted without causing appreciable renal lesions after thirty days' continued injections (and after this time not even the so-called physiological albuminuria supervened). In connection with this question of etiology it is of interest to note the relative infrequency of this symptom (either pathological or physiological) in the native Indian population in comparison with Europeans, as observed by Hailey,²⁰⁶_{July} of the Royal Indian Medical Service. From statistics gathered from a large number of instances of life insurance examinations, and from official records at Washington of examination of apparently healthy men, made before and after their daily exercise, Shepherd¹³⁸_{July 15} concludes that this condition is less frequent in America than in England, Stewart giving 3 per cent. as the average in the latter, while in the United States it is but 2 per cent. Further, Shepherd concludes that albuminuria is especially met with in brain-workers, rather than in muscle-workers, and that while but rarely found after meals in the urine of non-dyspeptic persons, in those suffering from dyspepsia and oxaluria it is relatively common. Privation, scanty food and clothing, unsanitary surroundings, cold bathing, severe physical exercise, in his experience, have marked influence in increasing the liability to the establishment of the condition. In the majority of cases the symptom is not associated with renal lesions, but the existence of such a condition as a "physiological albuminuria" is, in Shepherd's opinion, very improbable. According to Lecorché and Talamon,¹¹⁵⁶ the predisposition increases rapidly with increase of years. These authors do not admit the possibility of a physiological albuminuria, regarding every instance as associated with a nephritis—often latent, localized, and escaping unnoticed, but invariably present—beginning, perhaps, in a dyscrasic form, but invariably leading to terminal Bright's disease. The same view, practically, is taken by Johnson,⁶_{Jan. 7} who urges the clinical importance of this group of albuminurias in the apparently healthy, insisting upon the sequential appearance of an incurable nephritic albuminuria. Another writer, Hall,²_{Feb. 18} from an insurance point of view, recommends that no persons suffering from albuminuria should be accepted

as risks. He quotes from Munn's tables in the United States Insurance Company: Of sixty-nine cases of albuminuria in apparently healthy men seen in 1878-'79-'80, Munn has known four to die and the general health and appearance of the majority to have gradually deteriorated, and from this experience he is led to regard the condition, even in those apparently in good health, as of considerable significance.

A number of writers, on the contrary, in speaking of this albuminuria in the apparently healthy, do not regard it of the same significance as the above and draw sharp lines between this condition and Bright's disease. Tyson, ⁹_{Nov. 17} in a paper upon the relation of the functional form of this condition and life insurance, does not consider it of the same gravity, and urges that under certain conditions these albuminuries be admitted to the benefits of the system of life insurance. These conditions are, in his opinion, that the risk be otherwise in good physical health; that the albuminuria be unaccompanied by tube-casts; that if the quantity of albumen be large the applicant be rejected irrespective of the presence of casts; that there be a tendency toward a cyclical character in the albuminuria; that the specific gravity of the total urine of the twenty-four hours be, excluding, of course, glycosuria, relatively high; that the signs of left cardiac hypertrophy and vascular tension be absent; that the risk be below forty years of age; the exclusion of gout; and the absence of retinal albuminuric symptoms.

There is, however, considerable diversity among the various teachers as to the etiology and symptomatology limiting this affection; and the terms, functional, physiological, cyclical, intermittent, mechanical, postural, and dietetic, have been variously applied according to the views and fancy of the writer.

Merley ⁶_{May 19} confirms the original observations of Pavy and Tessier as to the cyclical character of the intermittency often noticed. He states that in the urine of these cases there is commonly an excess of coloring matter, a considerable quantity of albumen, an exaggerated elimination of urates, and a marked increase in the urea excretion (in this last point confirming Ralfe's theory accounting for the condition by an increased hæmalytic action of the liver). Merley, after reviewing the causes assigned for the condition, states his adherence to the view of an underlying dyscrasia (often the uric acid diathesis) as having particular influence. Stirling, ⁶_{Dec. 24}

on the contrary, asserts that in his experience constitutional taint is the exception, and that in a large number of cases demonstration of a vasomotor disturbance is impossible. In one group an increase of urea and pigment is found, but certainly not in the larger number, while, too, anæmia cannot be said to be present in any considerable proportion.

Pavy ⁶_{Apr.14} again insists upon posture as invariably the cause of this intermittent type of albuminurias; can see no relation between these cases and Bright's disease, nor that the former tends toward the latter as a terminal stage. As an illustration of this form Godrich ⁶_{Apr.28} mentions a case under his care thirty years ago, recovered some months from a scarlatina, in whom albumen could invariably be found after exercise at rowing, and at that date the author had recognized the non-nephritic character of the case, and spoke of it as of mechanical origin. Klemperer, of Berlin, ¹¹⁴_{Ba.12,H.1,2} regards cyclical albuminuria as a well-characterized type of disease. These cycles are commonly completed within the day, but in a case narrated by Klemperer there were two cycles, the maxima falling in the forenoon and afternoon. The relation suggested in the thesis of Lecorché and Talamon ¹¹⁵₆ and the writings of other observers, that this so-called physiological albuminuria is in reality a hæmatogenous albuminuria, modified, perhaps, by various circumstances, would be borne out by Gresswell, of London, ¹⁵_{Oct.} who has noted the presence of an intermittent postural albuminuria independent of the presence of formed elements in the urine in scarlatinal cases, appearing in the erect posture, and disappearing in the recumbent. In such cases there is no difficulty in supposing an albuminaemia, which, if associated with increased renal blood pressure, as in the erect posture, is readily converted into an albuminuria; but, unattended by any such agent as vascular pressure, escapes excretion until converted into its proper excrementitious form, or is again employed in the economy.

Stokes ⁶_{Mar.10} mentions a case of albuminuria dependent apparently upon a condition of lithiasis in a man in good health. The lithiasis is influenced by the patient's habits, especially by the use of beer. If the beer is stopped the lithiasis abates, and with it the albuminuria. This same writer mentions an instance of albuminuria in a man, aged sixty years, in whom it has existed for twenty years without any especial effect being apparent. Glover ⁶_{Mar.10} reports

a case of temporary intermittent albuminuria following too free ingestion of egg-albumen.

Hergott, of Nancy,¹⁵²_{Oct. 2} in speaking of the albuminurias of pregnancy, distinguishes three varieties—that of pregnancy, of labor, of the puerperal stage. The first is explained in a variety of ways. Gubler would regard it as a hyperalbuminuria from blood pressure. Maguire,⁶_{May 19} views it as of a dyscrasic nature, later on in some cases leading to organic renal lesions. Quite recently Doléris has found in the urine of pregnant women a bacillus, inoculation of rabbits with which reproduces albuminuria. Wiedow,⁴¹_{Aug. 2} in studying this albuminuria, mentions six cases of premature labor necessitated by threatened eclampsia, in which the placenta was in each degenerated and in several atrophied. Mannaberg, of Vienna,²¹⁹_{Bl. 9, No. 30} has been able to isolate from this variety of urine a streptococcus corresponding in amount to the gravity of the case, behaving somewhat differently upon cultivation from the ordinary pyogenic streptococcus. Injected into the veins of rabbits, a severe glomerulo-nephritis was produced in three or four days, with the appearance of red blood-corpuscles, crystals of hæmatoidin, etc., in the urine. Ralfe,⁶_{May 26} suggests that in a number of cases of albuminuria in pregnant women (especially in those cases whose morning urine responds to the tests for albumen) the albuminous materials are often of entirely extrarenal origin, from vaginal discharges which had collected in the horizontal position and drained off when standing or moving in the erect posture. He mentions the case of a young man whose early morning urine was full of albumen, caused by the presence of spermatozoa.

Favier,²¹²_{Mar.} relates a curious instance of rheumatic metastasis to the kidney in a case of acute rheumatism, in which after several weeks the arthritic pains were supplanted by an acute lumbar pain. The urine at once became frequent, brownish, albuminous. Three days later the symptoms abated, the albumen decreased, and the case progressed to cure. Sweeting,¹⁵_{Oct.} in his report to the Committee on Statistics of the Metropolitan Asylums Board, suggests the potency of overcrowding as a factor in determining the relative frequency of appearance of a post-scarlatinal albuminuria in hospital patients. Gellé,³⁷_{Apr.} records the sudden oncome of deafness as an albuminuric sequence, in a patient in his charge. In a contribution upon the albuminuria met in insanity Koeppen,⁷⁵_{July 16} makes these

two classes: those in whom the mental symptoms may be directly referred to uræmic psychical intoxication, and those dependent upon general arterio-sclerosis. Albumen is found in almost all the acute beginning forms, as acute delirium and the active stage of mania. In these cases propeptone is frequently associated with the albumen. It is the first symptom, according to Koeppen's researches, of the influence of the brain upon the renal functions, and persists until a lessening of the mental symptoms sets in, thus indicating in a manner its central origin. The urine in these cases has a high specific gravity, with the presence of but few formed elements.

In the albuminuria of rheumatism Jaccoud¹⁰⁸_{May 15} advises caution in the use of salicylate of sodium, replacing it preferably by a bromide or the bromhydrate of quinine.

TESTS FOR ALBUMEN AND ALLIED SUBSTANCES.

Recently a densimetric method for the estimation of albumen has occupied the attention of Huppert and Zahor⁸³_{Bd. 12, H. 6; Nov. 24}, the simplicity of which promises its future popularity, wherever the second decimal of the result is not regarded as necessary to the excellence of the analysis. The specific gravity of the urine is first taken, and then, after a preliminary examination to determine approximately the amount of dilute acetic acid necessary for the entire precipitation of the albumen upon boiling, the urine is freed from albumen by the addition of acetic acid and heat, and subsequent filtration. The filtrate, tested by acid and heat to preclude the presence of any more albumen, indicates a loss in specific gravity; which loss, upon multiplication by four hundred, yields as a result the number of grammes of albumen in one hundred cubic centimetres of urine. The factor, four hundred, ascertained experimentally from a number of albuminous urines, is found to give approximately correct results, and depends upon the mean value of the specific gravity of albumen, which, according to Zahor, is 1.3747. The average error is stated to amount to 0.0175 gramme, which may amount to 0.05 gramme.

Mya¹⁷_{June 21, 28} has commended the use of nitroprussiate of soda in the same manner as the ferrocyanide of potassium; however, in cold solutions uric acid responds to this reagent, and, too, the nitroprussiate is preserved with considerable difficulty.

Kowalski¹⁷_{June 21} suggests the use of acetate of uranium in excess, which precipitates the various forms of albumen and is quite sensitive in a solution containing 0.019 per cent. of albumen.

An ingenious method for the discovery of the quantity of albumen in urine has been invented by Christensen, as reported by Eklund, corresponding editor of Stockholm. This experimenter precipitates the albumen in five cubic centimetres of urine with ten of a watery solution of tannic acid (1 per cent.). The albumen precipitated, one cubic centimetre of an ordinary gum arabic mucilage is added, the volume brought up to fifty cubic centimetres with water, and the whole converted into an emulsion by agitation. Upon a piece of white paper ruled with black lines 0.5 millimetres wide and at equal intervals is placed a small cylindrical glass measuring four centimetres in diameter. This is half filled with water, and as much of the emulsion in the burette run in as possible without obscuring the black and white lines beneath the vessel. From the number of cubic centimetres required, reference to a table of calculations arranged by Christensen furnishes the proportion of albumen present in the emulsion. Where the urine is alkaline, or where, in cases of acid urine, the albumen is not readily coagulable, the addition of several drops of acetic acid is recommended. The method, of course, is of no value in cases containing a small amount, the variations, according to Christensen, amounting to two thousandths.

Christensen and Mygge³⁷²_{Nov. 7, 8, 9} (reported by Eklund) urge the use of a constant temperature in employing Esbach's instrument for the quantitative estimation of albumen, a caution also pointed out by Czapek⁸⁸_{Apr. 11} of Prague.

In a comparative study of the great number of tests for albumen, Lecorché and Talamon¹¹⁵⁶ regard as the most satisfactory for small amounts Tanret's or Millard's reagent, either one being sensitive enough to recognize 0.0005 per cent., or even 0.00033 per cent. In a paper upon the subject, Chéron confirms this statement; placing next in delicacy the saturated solution of picric acid (0.001 per cent.) and the combined employment of acetic acid and potassium ferrocyanide (0.002 per cent.).

For the purpose of eliminating the mucin which is precipitated by a large number of reagents serving as tests for albumen, and which thus masks the results, Jeanton¹⁷_{June 21} has recently proposed

to add at each analysis acetic acid, although care must be taken not to add too much in proportion to the existing reaction of the urine, and thus possibly render the albumen incoagulable by heat. Carter ^{Feb. 18}² calls attention to the possibility of the presence of nitrate of silver as an impurity in nitric acid, giving a precipitate with the chlorides of the urine almost indistinguishable from albumen.

Other Proteid Substances in the Urine—Globulinuria.—A number of occasional proteid substances, the results of albuminous decomposition, of incomplete metabolism, and occasionally of pathological significance, may be found in the urine. The ordinary heat and acidulation tests do not suffice to differentiate the albumens commonly found, and various methods have been devised to separate these different substances. The albumen of Bright's disease is really made up of a number of compounds, two of which, *serum albumen* and *globulin*, comprise the vast bulk of what is present. The former is generally recognized and its significance largely understood. The latter, however, causes considerable question in the minds of observers, and there is no established opinion of its consequences or antecedents. A number of methods for its detection and estimation are known and practiced. The method most in vogue depends upon the precipitation of this substance by a saturated solution of sulphate of magnesia after neutralization of the urine (Hofmeister). Pohl ^{June 21}¹⁷ prefers the use of sulphate of ammonium after neutralization of the urine with ammonia and separation of the precipitate by filtration; and other methods are practiced by various investigators. Globulin and serum-albumen appear to vary in relative amounts in any given specimen of albuminous urine, according to the reaction of the urine, the highly acid liquid containing large proportions of globulin.

Propeptonuria.—Posner, ^{May 21}⁴ reviewing the work of previous writers upon this subject, has demonstrated this form of albumen in the urine of men who from any cause may be the subjects of spermatorrhœa, where there is likelihood of mistaking its presence for that of serum-albumen or peptone, either of which are of clinical significance, while propeptone, as yet, cannot be regarded as having any special diagnostic value. It resembles peptone in that it fails to respond to the ordinary heat test and does react with biuret, but it follows serum-albumen in its reaction with acetic acid and potassium ferrocyanide, acetic acid and sodium

chloride, and with picric acid. It is thrown down, too, by cold nitric acid, but heat causes its solution again. The condition, according to Posner, is not peculiar to conditions of spermatic derangement, being occasionally found in women and children.

Peptonuria.—Considering the clinical value of this symptom, Chéron¹⁷_{June 21} divides it into three provisional classes: pyogenic (Hofmeister, Maixner, v. Jaksch), hæmatogenous (v. Jaksch), and enterogenous (Maixner). Besides these, Bouchard admits a hepatic variety, and others a renal class. Found in a meningitis, for example, it is of exceeding value in the exclusion of a tubercular character from the diagnosis; in the hæmatogenous variety it is especially found in such conditions as scurvy, or the infectious fevers; in the intestinal form it characterizes a large number of alimentary disarrangements, ulcerations, simple gastritis or enteritis, or the graver forms of such inflammatory conditions. Fock⁴¹_{Oct. 15} has examined the urine in one hundred and twenty-nine cases, making in all five hundred and thirty-one analyses; and in fifty-eight instances peptonuria was positively established, comprising cases of angina, cancers of the uterus, breast, brain, inguinal glands, gall-bladder, liver, and peritoneum, cirrhosis and acute yellow atrophy of the liver, catarrhal jaundice, and pernicious anæmia. It was found, but not constantly, in cases of bronchitis, pleurisy, peritonitis, meningitis, acute articular rheumatism, ulcer of the stomach, and in œsophageal and gastric carcinomata. Peptone may be sought for, from such experiences, in conditions marked by foci of inflammation and suppuration, in states of marked hæmatic destruction or infection, and in cases involving alimentary or hepatic lesions.

Thormählen²⁰_{Bd. 108, H. 2} describes a sediment found in a urine recently examined by him which had the appearance of a grayish, pap-like substance containing humps, which here and there adhered to the sides of the vessel. The substance was entirely dissolved by the addition of caustic potash solution and heat; yielded with acids a heavy precipitate, which would not dissolve under heat and was of a yellow color. The solution gave a precipitate when treated with cold sodium chloride solution, potassium ferrocyanide, and acetic acid, and responded to the ordinary tests for albumen. Thormählen considers it as a peculiar albuminous body, separating spontaneously from a strongly acid urine containing much salicylic acid,

not coagulable by heat, but readily precipitated from both hot and cold solutions by acids.

GLUCOSE AND ALLIED SUBSTANCES.

Nylander's Reagent.—This solution ²¹¹_{Mar. 18} ⁷³_{July 14} is to be prepared after the following formula: Subnitrate of bismuth, two grammes; tartrate of sodium, four grammes; solution of the carbonate of sodium (8 per cent.), one hundred cubic centimetres. After mixing, allow the mixture to stand for twenty-four hours and filter through glass-wool. It will remain unaltered for a very long time. In practicing the test, place into a tube ten cubic centimetres of urine and one cubic centimetre of the reagent, and heat. If sugar be present, a black precipitate will at once fall, although even in normal urine a similar precipitate may be produced after allowing the mixture of urine and reagent to stand for a day. Le Nobel ⁷³³_{Mar. 5} regards this test as quite accurate for even so small an amount of glucose as 0.025 per cent. According to Paul Chéron, ¹⁷_{Jan. 19} this same test result is accomplished by the urine of persons to whom have been exhibited such substances as kairin, eucalyptus, quinine, turpentine, and rhubarb, such facts distinctly lowering its value for the purpose proposed.

Marson's Test.—Marson ²²_{Feb. 16} has proposed sulphate of iron and caustic potash as a means for the detection of sugar. According to his directions, one hundred and twenty minims of urine are placed in a test-tube and about a grain of the iron salt added, when the mixture is heated. Following this, five grains of the potash are added, and the whole brought to a boil. If sugar be present, a dark-green precipitate will be formed, the supernatant liquid being reddish-brown, or black, according to the amount of sugar present. If there be no sugar in the specimen tested, a greenish-brown precipitate will be thrown down, while the supernatant liquid will remain colorless.

Recently, Hans Will ¹⁷_{Jan. 19} has proposed to estimate the glucose gravimetrically, but his methods are quite complicated and scarcely to be practiced outside of the laboratory.

Agostini's Test.—This test, according to Skor, ¹⁷_{Jan. 19} is of the highest value both for the readiness of application and for the extreme delicacy of observation which it affords. It depends upon the appearance of a beautiful violet-colored vapor upon warming

five drops of urine with five drops of a one per mille solution of chloride of gold and two drops of a 0.5 per cent. solution of potassium hydroxide. Skor²¹_{V.11, No. 47} states that it is possible by this method to recognize the presence of 0.0001 per cent. of glucose in water, and of 0.003 per cent. in urine. Paul Chéron¹⁷_{Jan. 19} regards it of considerable value if the presence of albumen be eliminated, but Rosenfeld⁶⁹_{Nos. 23, 24; Aug.}⁹⁰ states that he has been able to produce the result with urine from which all the sugar had been removed by fermentation. This last objection, however, in my opinion, can have but little weight from the many possibilities of incomplete removal by the means employed by Rosenfeld.

Fehling's Test.—In order to more exactly determine the end of the reaction in performing the quantitative application of this test in titrating the diabetic urine with Fehling's solution, which is marked by the disappearance of the blue color in the end solution, Munck¹³_{Bd. 213, No. 2, '87} recommends that a few drops of a solution of chloride of calcium be added to the end mixture. By this means a better and more rapid separation of the oxide of copper takes place, thus affording quickly a clear supernatant liquid in which one can more readily recognize even a faint blue tinge. Munck uses a 15.8 per cent. solution of the calcium salt. In case of a strongly glucotic urine—which may be diluted with from seven to ten volumes of water—three to five drops of this solution should be used; in a urine with less than 1 per cent. of sugar ten to fifteen drops must be taken. In such weak urines there is always a question how much of the reduction in this test is done by the sugar and how much by the other reducing substances which may be present. Munck has calculated from a series of observations that these reducing substances expressed in the terms of grape-sugar are normally contained in urine from 0.16 per cent. to 0.47 per cent.—average, 0.3 per cent.

Jolly¹⁷_{Jan. 19} regards this reagent of Fehling's as an evidence not only of the presence of sugar, but also of uric acid, peptones, and phosphoric acid in excess. The steps of the observations and deductions followed by him and mentioned in Chéron's article upon the various tests may be deemed worth reproduction here:—

1. Place in a test-tube about one cubic centimetre of Fehling's solution and eight or ten cubic centimetres of urine. The mixture after agitation shows a blue and turbid appearance. Without

allowing it to settle, it is brought to the boiling point: (a) If the solution remain blue, the indication is negative. (b) If decolorized, with light-yellow, flocculent precipitate and amber-colored supernatant fluid, peptone. (c) If the solution take on an orange tinge, and after a few moments of standing an orange-yellow precipitate is thrown down, glucose.

2. Bring equal parts of the reagent and urine to a boil in a tube: (a) If the liquid change slightly in color let it stand a few minutes. (b) If it clear up, the solution remaining blue, there is a small amount of uric acid present. The precipitate is a grayish blue in color. (c) The liquid is clear and green—there is indicated an excess of uric acid or urates. The precipitate is a grayish green, and varies in amount. If slight, the quantity of phosphoric acid is slight; in larger amounts it indicates larger proportions of phosphoric acid. (d) The solution acquires an orange hue; after standing the clear portion has a brown tint and the precipitate tends to a red—glucose.

With such (equal) proportions of the reagent and urine, the peptones are not shown at all; and, therefore, no matter how small an amount of the copper salt is decomposed, one should suspect glucose.

3. Place in a test-tube one cubic centimetre of urine and four or five cubic centimetres of Fehling's solution, and boil: (a) No change in color—result negative. (b) Color changes to a yellowish green and to a bright orange—glucose. The different colorations indicate, according to Jolly, a greater or less amount of sugar. Depending upon the amount of the copper reduced, the precipitate is more or less red—the color of the solution depending on the unreduced salt.

Delicacy of the Various Tests.—Rosenfeld⁶⁹_{Nos. 23, 24} has made a long series of experiments with a view of testing the relative delicacy and reliability of the various diabetic tests, arranging them in three groups, depending upon the reducing power, the power of deviating a ray of polarized light to the right, and fermentation. Rosenfeld regards Trommer's test reliable only when the suboxide appears suddenly and uniformly throughout the liquid just before the boiling point is reached in heating it, and places its best limit at 0.2 per cent. Fehling's, in his estimation, is no better. By Seegen's modification, occasionally as low a percentage as 0.1 per cent. can be detected, but not always. Seegen

passes the urine through animal charcoal (made of blood), which absorbs the sugar; this last is washed with pure water, and the washings tested. As all the reducing substances are not necessarily removed in this process, Rosenfeld does not regard it as of much more reliability than the others. He finds Rubner's (warming with ammonia the filtrate from ten cubic centimetres of urine and three grains of lead acetate) fairly reliable to the limit of 0.1 per cent. Johnson's picric acid test he characterizes as not very reliable and not especially sensitive. Molisch's (α naphthol, and thymol) he finds very delicate but rather uncertain. Rosenfeld places the limit upon these tests as 0.05 per cent. Skor believes them reliable in quantities of glucose not less than 0.001 per cent. in water, or 0.01 per cent. in urine. Penzoldt's test (dibenzol sulphate solution, fresh, added to the diabetic urine, and the mixture rendered alkaline, giving a dark-cherry color to the liquid) will reveal 0.05 per cent. of sugar; but acetone, pyrocatechin, and probably other compounds will produce the same effect. Of all these reduction methods the best reliable results in Rosenfeld's experience are obtained with amounts of glucose not less than 0.1 per cent.; and of the usual tests he regards Böttger's as the best except for minute quantities, for which the phenylhydrazin test gave the best results, establishing for itself a minimum limit of 0.033 per cent. Polarization yielded reliable results, but did not reveal the presence of sugar in a less proportion than 0.2 per cent. In the usual fermentation methods (in which he does not consider the absorption of the carbon dioxide by the liquid at all) Rosenfeld holds that the yeast may ferment itself and thus constitute a fallacy in the estimation; for the avoidance of this error he urges that a limit of six hours be placed upon the fermentation, observations upon yeast proving that autofermentation does not take place before fifteen or nineteen hours. Einhorn has shown that after standing in the apparatus usually used for this test, even pure water will give off a gas (air) without the addition of a ferment; and this fallacy is sought to be overcome by boiling the urine. In practicing the fermentation test, then, Rosenfeld boils the urine first, and after allowing it to cool to the ordinary temperature adds the yeast, allowing the process to continue no longer than six hours. By this means he has been able to detect the presence of as low a percentage as 0.05 per cent.

Reducing Substances—Uroleucic Acid.—Under this name Kirk²⁷⁷_{Oct.} reports the discovery of a new acid, having the probable formula $C_9H_{10}O_5$ with an intense reduction power upon Fehling's solution, and darkening upon mixture with alkalis. The substance reported by the same author last year as urrhodinic acid, has, upon further investigation, proved to be a mixture of two or more constituents, which Kirk has been able to separate by means of the action of neutral lead acetate. It was noticed that this last substance did not throw down all the ingredients when added to a solution of urrhodinic acid, but left behind a pale-yellow, aromatic filtrate. The precipitate, too, if allowed to settle gradually, separated into two portions, a dark and a light, and both of these yielded bodies with reducing power. For separating these two, the following method was pursued: "A concentrated solution of the mixed substances was prepared by dissolving them in a small quantity of hot (not boiling) water, and thus filtered to remove any trace of insoluble material. To the filtrate, which has a deep-red color, a saturated solution of lead acetate was gradually added, and the dark precipitate which falls removed by repeated filtration. When the filtrate had become yellow, with, perhaps, a tinge of brown, it was transferred to a mortar, and to avoid further dilution some solid lead acetate powdered amid the solution with the pestle. In a few minutes a cream-colored precipitate fell, consisting of the lead salt of the acid sought for, with some excess of lead acetate. This precipitate was washed on a filter with water until the washings ceased to have an acid reaction, and then suspended in water and the lead removed by H_2S and filtration. The resulting solution was either evaporated *in vacuo* over sulphuric acid, or extracted with a large quantity of ether—in either of which ways a definite compound with marked acid reaction was obtained, crystallizing in stellate groups. On account of its opaque, milky appearance, Kirk proposes to name it *uroleucic acid*. The crystals have a melting point of about $133.3^\circ C.$, and upon investigation the above formula of $C_9H_{10}O_5$ was determined, as well as its monobasic character. The acid is very soluble in alcohol and ether, but somewhat less in water. It gives all the reducing actions mentioned by Bödeker for alkapton, but the most interesting point in this connection is that it reduces bismuth, throwing down the black suboxide in abundance when boiled with Löwe's bismuth-test

solution. To do so, however, the solution employed must be of the strength of one-half per cent. or upward, and hence the reason why this fact had never been noticed, the percentage in the mixture of the precipitates or in the free urine having been too slight. It gives with ferric chloride a transient green color, instantly disappearing on diffusion of the two liquids, and incapable of being rendered permanent with any proportions of the reagent. A drop of the ferric solution added to the crystals of the acid produces a red color."

The remaining constituents of "urrrhodinic acid" have not been fully studied as yet. The aromatic pale-yellow filtrate, above mentioned, yields an amorphous acid substance of a yellow color, with a somewhat less power of reduction than uroleucic acid, and named by Kirk *uroxanthic acid*.

A third substance, also acid in reaction, is yielded by the dark precipitate, also with strong reducing powers, but recent investigations of Kirk and his collaborator, Rev. Mr. Gibson, tend to prove that this substance is really produced in the course of the analysis, and does not exist as such in the urine. None of these three substances have any effect in the polarizing of light. The striking similarity between these substances and Bödeker's alkapton would strongly suggest the identity of this latter with at least one of Kirk's acids.

Physiological Glycosuria.—The possibility of this condition is suggested by the results of observations of Rosenfeld⁶⁹_{Nos. 23, 24} upon the value of the combined employment of the fermentation and reducing tests as suggested by Worm-Müller. Of forty-two supposedly normal urines tested in this way Rosenfeld found that 33 per cent. contained sugar. Examined by the phenyl-hydrazin test, 16.60 per cent. were found to be glycosuric. The author inclines to this theory of a physiological glycosuria, and believes that he is able to differentiate it from the pathological variety by the administration of a starch, as that contained in white bread, which always causes an increase in the glucose in the urine of diabetics but does not influence the sugar in normal cases. Squire²⁶_{Sept. 1} notes that of the last two hundred cases in his register, thirty-nine are glycosurics, commonly non-persisting in the duration of their symptoms.

Artificial Glycosuria.—Arthaud and Butte¹⁶⁴_{Feb. 19} have been able to produce glycosuria in dogs by irritating the peripheral end of

the pneumogastric nerve. The quantity of sugar varies greatly; generally the symptom appears in three or four days after the injury. The exact change upon which the condition depends these experimenters cannot demonstrate, but they refer the general action to the abdominal visceral branches of the pneumogastric. Laborde³_{Feb. 29} states that he has been able to produce glycosuria in a rabbit by daily puncture of the floor of the fourth ventricle.

Burton⁶_{June 2} points out that while in toxic doses the salicylates cause the appearance of glycosuria, before the deafness, tinnitus, and concomitant symptoms no sugar can be detected, although salicylic acid is present in appreciable quantity. Pollatschek⁸¹_{May 26} mentions two cases in whom the exhibition of salicylic acid was followed by a reducing power in the urine.

Aceturia.—In relation to the ferric chloride reaction upon the diabetic urine, Le Nobel¹³_{Oct. 15} asserts that it in no way safely indicates the presence of acetic acid, since in a considerable number of instances the red color of the urine has undoubtedly been caused by the addition of formic acid.

Phosphatic Glycosuria.—Cerne³_{Mar. 4} has reported two cases of glycosuria associated with an excessive phosphaturia in children, each presenting foci of gangrene. The general symptoms, excluding those of the gangrenous process, were those of ordinary glycosuric diabetes. Verneuil³_{Mar. 4} mentions a case in which a patient suffering from malignant pustule presented a marked glycosuria. Under the influence of carbolic acid the anthrax improved rapidly and the glycosuria disappeared, to be replaced by a true phosphatic diabetes—so much so that at times the urine contained more than ten grammes of phosphate in twenty-four hours.

UREA.

It is suggested from an experience met with by Sée and Gley, of Paris,¹⁶⁴_{Feb. 19}⁶_{Mar. 19} while experimenting upon dogs with a view of producing glycosuria, that there probably exists a centre governing the formation of urea. These investigators caused azoturia by irritating the central end of the divided right vagus nerve with a mixture of glycerine, water and lycopodium injected into that portion of the nerve after section.

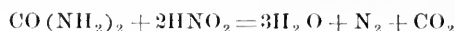
Agostini³⁷⁶_{May}⁴¹_{Sept. 6} points out an interesting relation in the action of bromide of potassium, in that for a time it lowers the formation

and excretion of urea during its own elimination from the economy. After a time an accommodation is established, which quickly disappears, however, upon cessation of the drug.

Robin³_{Sept.26} insists, in a recent paper upon the "Urology of Small-pox," upon the augmentation of urea from the commencement of the invasive stage. This persists during the height of the disease, rises again at the moment of suppuration, and ceases when convalescence is established. Gautrelet²⁴_{Jan.29} calls attention to the frequent diminution of the urea in functional disease of the liver or general cirrhosis, and the possibility of confusing such conditions with the oncome of cancerous cachexia where a similar but continued diminution of urea may be noted.

Marcoff,⁶⁷_{Oct.30} in order to study the effect of an absolute milk diet upon the excretion of urea, placed three colleagues under such *régime* for fifteen days, and observed the variations in this constituent. He announces as results that the total quantity of nitrogen depends, in such a diet, upon the amount of milk ingested—increasing as the amount of milk grows smaller, decreasing as it grows larger; that the quantity of urea varies inversely with that of the extractives; and that uric acid is generally diminished.

*Campani's*⁶¹⁶_{v.17; Feb.18} *Volumetric Estimation*.—This depends upon the decomposition of urea by nitrous acid, as follows:—



"A tube of two hundred cubic centimetres is fitted with a cork and delivery tube, into this are placed twenty cubic centimetres of a 10 per cent. solution of potassium nitrate, then two cubic centimetres of urine, and finally five cubic centimetres of a 5 per cent. solution of sulphuric acid. The contents are then warmed and the carbon dioxide which is evolved is passed through lime-water of known strength. The reaction once completed, the amount of lime neutralized by the carbon dioxide is determined by treating the solution with a centinormal solution of hydrochloric acid, using phenol phthalein as the indicator. The number of cubic centimetres of hydrochloric acid used by a given quantity of lime-water before the experiment minus the number of cubic centimetres used after the experiment multiplied by 0.00022 gives the weight of the carbonic oxide evolved from two cubic centimetres of urine. As eleven grammes of carbonic oxide correspond to fifteen of urea, the percentage result is readily arrived at. Test experiments are fairly

concordant with each other and with Liebig's mercury method. The reaction should proceed slowly, otherwise nitrous oxide is evolved."

Sehrwald, of Jena, ³⁴_{Nov. 13} has suggested an extremely simple and practical method for the employment of the hypobromite of soda solution in modification of Hüffner's complicated and costly apparatus. A glass tube graduated into one-tenth cubic centimetres, and having a capacity of fifty or more cubic centimetres, is filled with the alkaline solution of bromine, and into the open end a rubber stopper, perforated and fitted with a broad U-shaped tube, is fixed. This apparatus is inverted into any ordinary tube containing a concentrated solution of sodium chloride. By means of a graduated glass syringe with a delicate rubber tube attached, just five cubic centimetres of urine are now discharged into the upper portion of the inverted hypobromite tube, and the whole allowed to stand for fifteen or twenty minutes for the reaction to take place. This completed, the apparatus is carefully transferred to a deeper vessel of sodium chloride solution or water, and, having adjusted the level of the solution within the tube with that in the outer vessel, the number of cubic centimetres of nitrogen evolved in the reaction are read off, and the usual calculations carried out for the result. Instead of removing the apparatus to a deeper vessel for the purpose of adjusting the pressure of the gas evolved, an open glass tube filled with the solution may be attached by means of a rubber tube to the apparatus, and, the level of the liquids in the two tubes being adjusted, the result is obtained. The simplicity of the apparatus and the ease of manipulation commend this means to the general practitioner.

Cazeneuve and Hugoumenq's ²¹¹_{June 3} *Modification of Dumas' Method for the Estimation of the Entire Quantity of Nitrogen in the Urine.*—In this method Dupre's apparatus for the collection and measurement of the nitrogen gas evolved is attached to the ordinary appliance of Dumas for the evolution of this constituent of the urea and other azotized substances in the urine. Instead of the acid carbonate of soda used in Dumas' method for the evolution of carbon dioxide for clearing the combustion tube of atmospheric air, in this modification the dry carbonate of manganese is employed. This generator is preferred because it is readily kept dry, because its decomposition is attended with a change in color, and

because upon removal of the heat it does not reabsorb the CO_2 , and thus cause a suction of the gases into the posterior part of the combustion tube. In charging the remainder of the tube the usual methods are followed, except that in mixing the urine with the oxide of copper it is first made into a paste with oxalic acid and then desiccated over a water-bath. By this means a more thorough decomposition of all the azotized substances is brought about and the analysis made more complete. Compared with such methods as Kjeldahl's and Wills' and Varrentrap's, this method shows a considerably larger percentage amount than either of the others, according to estimates of the authors.

The Amorphous Urate Deposit.—Sir William Roberts,⁹⁰ in an investigation into the nature of the amorphous urate deposit, substantially corroborates Bence-Jones' conclusions that this deposit is made up of the quadrate of the bases, ammonium, sodium, potassium, and lime.

This quadrate is an exceedingly unstable substance (formed by the union of the acid urate and uric acid), breaking up, unless restrained by some inhibitory substances, by the disintegrating power of simple water almost as soon as treated with it. In urine this decomposition takes place also, but more slowly, on account of the presence of bodies holding a restraining influence over the decomposition of the substance. By experiment Roberts determined that the saline ingredients of the urine, especially the phosphate of potassium, exercised such an inhibitory power and prevented the formation of uric acid within the body. He succeeded in artificially producing the quadrate of these four bases.

URIC ACID DIATHESIS.

Mach,²⁷³ has recently announced the results of several experiments upon fowls as to the relations of hypoxanthin and uric acid. In two chickens to which hypoxanthin was administered the exhibition of this substance was followed at once by a marked increase in the uric acid as well as in the total of nitrogen. Following these experiments, he cut the liver of a goose out of circulation and again administered hypoxanthin, with practically the same results. From these observations he concludes that in birds there is a possibility of the production of uric acid from hypoxanthin, and that this production does not take place in the liver.

Although no other new theories as to the exact origin of this acid have been published within the past year, it may not be deemed out of place at this time to mention a few of the more prominent views, owing to the considerable variation and confusion in the teachings of the various authors upon this subject, and upon the exact relation between the acid and the diathesis supposed to depend upon it. Most writers agree that at least in some degree the organ at fault in its production is the liver. Probably the Croonian Lectures, delivered by Latham in 1886, were the most important contribution to the literature of the subject within the past few years, the argument of which the author quotes in the discussion of Yeo's address²_{Jan. 7, 14} upon the therapeutics of this diathesis. Latham regards uric acid as depending for its formation upon the union of the excess of glycogen in the liver and urea, first producing hydantoic acid, and later, by the addition of more urea, uric acid, or its ammonium salt; and the author hence regards the diathesis depending upon uric acid as occurring only in instances where there is either a marked excess in glyco-genic formation or a similar imperfection in its consumption. A considerable number of authors, represented by Ebstein and other Continental investigators, look upon uric acid as a product, not of formative metabolism (as in the above view), but of destructive metabolism, present only in true pathological conditions. A neutral compound is normally present from normal tissue waste (especially marked in the fibrous and denser structures, as cartilage, particularly those far from the active central circulation), and this, brought into contact with free acid generated in necrotic changes, deposits in the form of the ordinary gouty tophi. Others have taught that uric acid is an intermediate product in the transformation of albuminous material into urea, a product of imperfect oxidation; and this view is opposed by those who hold that the formations of these two substances, uric acid and urea, are mutually independent. Among these last, Haig,²_{Apr. 28} from a valuable series of clinical experiments upon himself and others, concludes that there is a tolerably constant and normal proportion (1 to 33) existing between the formations and normal excretions of uric acid and urea; that they are mutually independent products of nutritive metabolism; that the variations in the relative amounts of uric acid and urea in the blood and in the urine are not variations in formation, but are due rather

to variations in excretion, retentions of appreciable amounts probably occurring in the liver and spleen. According to this writer, uric acid is, perhaps, never in excess in the blood except when from continued retention of small quantities there has been an accumulation of several grains in the liver and spleen, "which is all at once swept out into the circulation by a reversal of the process which previously caused the retention," and this sudden washing out into the blood of previous accumulations is regarded as a sufficient cause for many of the phenomena of uric acid diseases. The conditions favoring this retention, by diminishing the solubility of the uric acid, are increased acidity of the blood or the presence of such substances with which the uric acid may form insoluble compounds, as lead or iron. It is of interest to note that this author includes as occasional symptoms of this diathesis a large class of migraines and a notable proportion of epileptic seizures and instances of mental depression. Pepper,¹⁹_{May 5} in a clinical lecture, presented a case marked by heredity, in whom for years nocturnal epileptiform seizures have been noted, recently followed by occasional diurnal attacks as well. The patient periodically experienced headaches, attacks of renal colic, which were often accompanied by various neurotic phenomena, epileptiform fits, and hemispasmodic seizures in which the consciousness was preserved.

Brylants⁵²_{Jan.},⁵⁹_{May 19} in a series of communications to the Royal Academy of Medicine of Belgium, reports in relation to sulphocyanic acid that he finds it present not only in the saliva but in most of the fluids and secretions of the organism as well; that it is present in the urine normally to the amount of one-twentieth of a grain in a litre; that it is derived from albuminoid decomposition and depends largely upon the nature of the nitrogenous excretion; when this last, urea, is excreted normally, so, too, is the sulphocyanic acid (in its potassium salt usually); that in the uric acid diathesis, however, almost or entirely does the sulphocyanide disappear, furnishing another diagnostic test for the presence of this condition.

Therapeutics of Uric Acid Diathesis.—In his address before the British Medical Society, Yeo,²_{Jan. 7, 14} urges the importance of diet and regimen. He does not permit abstinence from animal food; limits the use of starches; forbids sugar, farinaceous foods, and

potatoes, and allows a moderate quantity of fruits and vegetables, urges large consumption of water, allows the higher grades of champagne or port, or the *still* Moselle wines, along with alkaline waters. Haig²_{Apr. 28} does not believe that any food will increase the formation of uric acid above its normal relation to urea (1 to 33); but such foods as cause increased acidity of the blood cause diminished uric acid excretion and increased retention, and *vice versâ*. A highly nitrogenous diet, he considers, will, of course, increase the formation both of uric acid and urea, but only in their normal proportions. With this view, Haig denies that in this diathesis meats can be taken with impunity, and depends largely upon vegetable foods for the sustenance of the patient. Of remedial drugs he inclines toward the ordinary alkalies as increasing the solvent power of the blood and other fluids in relation to the substance in question; toward phosphate of sodium and the salicylates as having a special solvent action, the latter group, too, showing a marked tendency to flush the liver and spleen. Colchicum he considers of much value, of doubtful mode of action; iodide of potassium, in his experience is of value only as an alkali. In a discussion upon a paper of Haig's upon the action of the salicylates in this condition, Lauder Brunton²_{May 28} considered at some length the views of this writer, and instanced several cases bearing toward them. Yeo recommends, in addition to diet and regimen, colchicum as of special value. He does not regard the salicylates as of value, except rheumatism be superimposed upon the gouty diathesis.

Stricker,¹¹⁴_{Bd. 14, H. 142; Aug. 18}⁶⁰ in his article upon the "Pathology and Treatment of Leukæmia," a disease in which urea and uric acid are always found in excess, asserts considerable benefit from the use of oxygen.

Van Noorden,³⁴_{Sept. 25} accepting the results of Pfeiffer as confirmed by Posner and Goldenberg, employs them clinically in the following manner, seeking to prevent the urine from ever having an acid reaction. Arranging a table of the variations in reaction for twenty-four hours, at intervals of three hours each, in most cases the periods of highest acidity are tolerably constant from day to day. Anticipating these rises by alkaline waters and alkalies, he seeks to prevent any gain in solution being replaced during the acid rise by an equivalent loss.

THE SULPHUR COMPOUNDS.

Sulphuric Compounds.—Kast and Baas³⁴_{Apr.} note, in a case of occlusion of the intestine by a cancerous mass, the excretion of sulphates and of sulphovinic acid before and after the establishment of an artificial anus. The proportion of the former to the latter was, before the operation, 1.99; after the operation, 2.0, gradually rising to 11, 19, 10, etc., on succeeding analyses. After the operation indoxyl and phenol gradually diminished. In a second case—high-seated rectal epithelioma—the rectum was cleared by clysters, and Kraske undertook resection of the bowel with subsequent union of the healthy rectal ends. Following the clyster, the proportion of sulphuric to sulphovinic acid increased and the amount of indoxyl decreased. After operation the bowel was found empty. The writers regard the ratio of these acids as a diagnostic signal for evacuating the bowel and as an indication for the limit of operation.

Avena¹¹_{Sept. 10} mentions three cases presenting intensely dark brown urine, in which a large amount of sulphovinic acid, along with indican, was found, the dark color probably depending, in his view, on a combination between the sulphovinic acid and carboic acid, with which all three had for a time been treated.

Hoppe-Seyler¹²⁶_{July 15} calls attention to the fact that in the intestinal affections, in which, as in peritonitis or cancer, but little absorption of the digestive products takes place, there is distinct augmentation of the sulphonic acids—so also when there is weak digestive power and the tract is rich in fermentescible bile substances.

Directly Combined Sulphur.—The study whether in the normal urine can be found cystine or an analogous substance has recently occupied the attention of Stadthagen, who comes to a negative conclusion, believing that no such compound is present, or, if present, in most minute quantity. Goldman, and Bauman¹²⁶_{July 15} come to the conclusion, however, that at least a small amount of such a substance is normally present. The method they follow depends upon the precipitation of a voluminous precipitate of benzoylcystine $[C_6H_{10}N_2S_2O_4(C_7H_6O)_2]$ upon the addition to the urine of a few drops of a solution of chloride of benzoyl. This salt is extracted with ether, the ether distilled, and the residue taken up by a soda solution. The lead salt is produced by the

addition of a plumbic solution, and the cystine obtained by the removal of the lead as sulphide of lead.

Rosenheim and Gutzmann,⁶⁹_{Mar.5} from clinical observations, conclude that hydrothionuria is generally caused by the presence of certain bacteria having the power of acting upon some one or more of the sulphur-containing substances in the urine. The possibility of resorption of the H_2S into the blood and its appearance through the kidneys—or a diffusion of the gas from the bowel—is not likely; the condition is usually a complication of cystitis. The point of attack of the bacteria is not definitely known, but the authors indicate the probability of the alkaline hyposulphites being the compound acted upon.

Oxalate of Lime.—Ellis⁹⁹_{Jan.19} advances an idea, based upon clinical observation, of the formation of the crystals of oxalate of lime as a form of imperfect nutritive metabolism within the intestinal canal, and questions whether the salt in any quantity is ever formed in the general economy, that passed in ordinary oxaluria being perhaps a fractional portion of that which has been formed and held in solution by the fluids of the economy.

ADVENTITIOUS SUBSTANCES.

Detection of Saccharine in Urine.—This¹³_{Aug.1} ¹⁴⁰_{Oct.5} substance is excreted unchanged by the kidneys, not playing any rôle as an aliment and being useful only as a mixing agent in foods. It may be detected as follows: One hundred cubic centimetres of urine are acidulated and added in small portions to fifty cubic centimetres of a mixture of ether and petroleum ether, decanted, and the solution obtained evaporated after the addition of sodium hydroxide. The residue is heated for half an hour at $250^{\circ} C.$, then dissolved in water well acidulated by H_2SO_4 . Treated with ether, the salicylic acid formed from the saccharine will be dissolved out, and this substance is then tested for. Other methods are as follow: (a) Treat the urine with 25 to 30 per cent. solution of potassium hydroxide and add liquid bromine drop by drop until a yellow precipitate falls. Wash this with cold water; take up the residual canary-colored powder with hot water. Allow to cool, when crystals will separate, the thorough investigation of which has not as yet been accomplished. (b) Heat the solution containing saccharine with an excess of resorcin and a few drops of

sulphuric acid. A colored liquid occurs after the solution cools and an alkali has been added to excess. This has a green, fluorescent appearance in direct light, red by transmitted light. This test will indicate the presence of 0.001 gramme of saccharine.

Detection of Antifebrine.—²⁶⁶_{Jan.} The urine is concentrated by evaporation and then boiled for a few minutes with hydrochloric acid. After extraction with ether the ether is evaporated and the residue treated with water, adding a few cubic centimetres of a watery solution of phenol and half the same quantity of a 1 per cent. solution of hypochlorite of lime. There is produced a color resembling that of an onion-peel, changed blue upon the addition of ammonia (iodophenol reaction). If the urine is not high-colored the reaction will occur without ethereal extraction.

Detection of Naphthaline.—⁴¹_{May 14} The addition of a few drops of ammonia or caustic soda solution to urine containing naphthaline is followed by the production of a blue fluorescence, due to the formation of β naphthol. Upon the addition of a solution of chloride of calcium and muriatic acid a yellow color is produced, readily distinguished from the normal urinary coloration due to the presence of β naphtholchimon derived from β naphthol. Penzoldt's green color may be produced upon the addition of sulphuric acid to urine containing this substance. Filter-paper moistened with urine containing naphthaline and touched with diazo-amido-benzol will turn red. Urine holding naphthaline will grow darker if it stands a few days, and under these circumstances is given a red hue upon the addition of acetic acid.

Microscopy.—An interesting study of the origin of the hyaline casts and cast-like bodies often met with in the urine of Bright's disease is contributed by Török and Pollak, ²⁷³_{Aug.} of Budapesth. No exact conclusion is arrived at, but the authors are of the opinion that the formation of these bodies is due, in a measure, at least, to an albuminoid fluid transuding from the blood and coagulating in the renal tubules—rather than that this substance is a product of cellular secretion or cellular metamorphosis.

Lecercf, ²⁴_{Jan. 22} mentions an interesting case in which he found under the microscope red blood-corpuscles and recovered crystals of the chloride of hæmatin, but found absolutely no albumen upon examining by the ordinary chemical tests. He explains this peculiar occurrence by the fact that, eight months before, the patient,

a child, had suffered severe renal injury from which apparent recovery had taken place. The blood was, possibly, retained during the interval in the tubules, and the albuminous materials washed out by the fluid passing over the corpuscles.

Several minor details in the technique of microscopy mentioned by the same author may be added with propriety. In examining urines in which, on account of the excessive presence of urate of soda, there is considerable difficulty in making out the formed elements, the urate deposit may be readily dissolved by running a drop of glycerine and acetic acid under the cover. In order to overcome the tendency of the glycerine to render the formed elements invisible by its clarifying power, a drop of weak alcoholic solution of eosine or of one of the other aniline dyes will suffice.

In the preparation of slides of urinary deposit for the discovery of micro-organisms, as the tubercle bacilli, there is some advantage in staining upon the slide rather than upon the cover-glass. The preparation may be readily examined without a cover, and upon the discovery of a focus of germs a circular line drawn with any sharp instrument about the objective glass will mark the spot for future reference.

Preservation of the Urine.—Salkowski²²_{June 6} finds for this purpose quite efficient a six per mille solution of chloroform. It effectually prevents the growth of micro-organisms, and the writer commends it for the keeping of pathological fluids and anatomical specimens.

Coloring Matters.—Pinchon¹⁰⁹_{Oct.} reports the peculiar coloration of a urine having the hue of a weak solution of potassium permanganate, due to an aniline contained in a curacao cordial taken in an alkaline water the previous evening.

MacMunn,²_{July 21} in a paper upon the urobilin series and their clinical aspects, states that the usually understood substance of that name really comprises three separate coloring materials,—normal urobilin, pathological urobilin, and a third known as urohæmatoporphyrin. The first he refers to an incomplete oxidation of a biliary pigment or of a small amount of bilirubin derived from the hæmatic pigment matter. The pathological urobilin, if derived at all from bilirubin, must, in the writer's view, be a more complete metabolite than the above, but in a number of cases he is convinced

that it is a direct derivative of hæmatin, and closely allied to the third, urohæmatoporphyrin. This last is derived not only from the hæmoglobin but also from the myohæmatin and histohæmatins. It is found in the urines of patients in whom, along with excessive destruction of hæmoglobin or histohæmatin, the glands concerned in their complete metabolism are unable to deal with the excess of effete pigments or are actually diseased, as in acute rheumatism, idiopathic pericarditis, Addison's disease, cirrhosis of the liver, croupous pneumonia, Hodgkin's disease, measles, typhoid fever, meningitis, and peritonitis.

Pisenti³¹⁹_{Nov.3} has established by experiments upon animals that the amount of indican in the urine bears close relation to the presence of a "pancreatic peptone" in the intestinal canal depending for its establishment upon the decomposition of that substance. After noting the normal amount of indican in the urine this observer tied the pancreatic duct, and within the first day after the operation the quantity of indican decreased from one-third to one-fifth of the normal amount; if, however, he included in the animal's nourishment a quantity of pancreatine, the amount in the urine at once arose for a time.

Fermentation Substances.—Hoffmann,³¹⁹_{Mar.17} in reviewing the work of previous experimenters (Sahli, Gehrig, Holovtschimer) upon the occurrence in normal urine of a ferment agent, comes to the conclusion that there are present pepsin and diastase. The former is apparently at its greatest height in the morning, and after several hours after dinner shows a marked diminution in quantity; on the other hand, the starch-converting substance increases after meals. As to the presence of trypsin, the author comes to a negative conclusion. Leo,³_{Apr.18} of Berlin, in endeavoring to discover a possible relationship between the presence of these substances in the urine and different diseases, concludes that the presence of pepsin has no diagnostic value whatever. He finds the diastasic power of the urine increased upon fasting, decreased in constipation, and augmented in most cases of diabetic glycosuria. This last augmentation is more pronounced in the graver cases, but it is not always proportional to the amount of sugar in the urine.

Salkowski,²_{Nov.3} has noticed in normal urine members of the fatty acids, mostly acetic acid, derivatives of the carbohydrates con-

tained in the urine through a form of acid fermentation when the liquid is exposed for a time to the air. This observation points significantly toward the probable exactness of certain recent assertions that there is a small amount of glucose physiologically contained in the urine as well as a substance resembling dextrose.

Linden²⁵_{Aug. 20} reports a case analogous to the above in which he found a large quantity of *saccharomyces urinae*, the removal of which by repeated antiseptic washings of the bladder was followed by a cessation of the symptoms.

Micro-Organisms.—Hartge⁸_{Oct. 15} mentions the occurrence of sarcinæ in the urine of a woman suffering from diabetic glycosuria associated with vesical and pelvic catarrh. Upon standing, the urine deposited a whitish sediment which covered the bottom and sides of the vase in a thin but solid layer, and upon investigation was found for the most part made up of sarcinæ. These fungi were found to be a constant constituent, uninfluenced by change in the quantity of sugar present or the reaction of the urine. A point of difference, however, between these and the more resistant variety found in the stomach is the fact that after ammoniacal change of the urine the sarcinæ rapidly disappeared.

Rosenheim,¹³_{No. 5} of Berlin, as mentioned in the last edition of the ANNUAL, refers the production of sulphuretted hydrogen in the urine to the action of certain micro-organisms. In urine of this character he has been able to demonstrate the presence of a bacterium having the following characteristics: Short rods, which in gelatine readily reproduce at ordinary temperatures; these stain more deeply with the anilines at the ends than in the middle; they grow without liquefaction of the gelatine, and can be cultivated also easily in acid media. Inoculation of the urine of a healthy person gave positive results in twenty-four hours, while the control experiment remained free from sulphuretted hydrogen even after a week's standing. The sulphur constituent of the urine upon which these organisms act the writer does not clearly establish, but he does not think the sulphates are affected.

Albarran and Hallé³⁴⁵_{Sept.} have studied a pyogenic infective bacillus found in pathological urine, which by inoculation into the anterior urinary tract produces first a purulent cystitis and later by upward extension invades renal tissues, causing the appearance of multiple infective abscesses and sometimes a general purulent

degeneration. Introduced into the circulation, it produces a marked general toxæmia, characterized by the purulent invasion of any point of weakened resistance. It is never seen in the normal urine even at autopsy. The bacterium is polymorphous, measures four to six μ long and two μ in breadth, is mobile, easily stained, and readily cultivated in the usual nutritive media at ordinary temperatures. It grows upon gelatine as a surface growth in a dense white mass. The authors credit several other organisms with the same pathogenic rôle.

Malerba and Sema-Salaris⁴¹_{Sept. 24} have found in human urine a bacillus, which upon replanting in normal urine causes it within twenty-four hours to become ropy, slimy, and viscid, as the urine in which it was first found. It is from 1.14 to 0.57 μ in length and 0.41 μ in width; readily receives the aniline stains. It grows readily upon gelatine plates or in tubes, in five or six days giving an opalescent appearance to the medium. In bouillon it grows well at 37° C., and the substance becomes opalescent and somewhat slimy in from twelve to twenty-four hours. In fresh sterilized milk at 37° C., within twenty-four hours it causes coagulation into a slimy mass, and the medium takes on a strong acid reaction.

In the study of the clinical significance of bacteriuria, Berlioz²¹¹_{May 15} and Neumann⁴_{Feb. 13, 27} have each conducted careful observations and from them have determined practically identical conclusions. In a certain class of diseases where at some time or other the circulation is invaded by the specific organism, as in anthrax, pyæmia, glanders, tuberculosis, or typhoid fever, occasionally these organisms may be recovered in the urine. The facility of passage of the bacteria through the kidneys depends upon the existence of some lesion in the renal structure. This lesion may or may not influence the production of an infectious nephritis, although probably most cases of such post-infectious nephritis depend upon embolic foci of these organisms in the renal circulation or upon the irritative action of the organic poisons arising from their activity. So far as the elimination of these germs by the renal organs is concerned, it is highly improbable that such should be the case, although the products of their invasion (ptomaines) are probably in all cases largely removed from the economy by this means. Normally no bacteria are to be found in the bladder urine, but in its discharge through the urethra it is almost invariably impreg-

nated with a variety of microbes, all non-pathogenic save one, a staphylococcus.

TOXICITY OF THE URINE.

Adduco, ⁴¹_{Aug.6} from extensive analyses of the urine of a large number of soldiers before and after severe marching exercise, concludes that in the physiological urine there is a toxic base containing sulphur, resembling generally neurin and cholin, but differing in a number of particulars from each of these substances. The physiological effect of this body the author reserves for further study. The muriatic salt of this base presents a reddish-brown, amorphous appearance, with a sharp, somewhat bitter taste; and the base differs especially from the two other sulphur-containing bases in its reactions with tannin, with iodide of potassium, and the double iodides of bismuth and potassium, and cadmium and potassium.

Some time since Musculus demonstrated the existence of a fermenting substance in the urine, having the property of rapidly inducing a decomposition of the urine. Falk ⁴¹_{Feb.13} has recently employed this substance, adding it to urine and injecting the resulting mixture into the circulatory system of animals. He, however, was unable to produce any results either in this manner or by the simultaneous injection at different points of this ferment and of normal urine.

Following the announcement which was made in 1884 by Bouchard ³_{June 6}; ¹²_{July} of his ability to reproduce cholera by vaccination with certain morbid principles recovered from the urine of a choleraic patient, the same investigator recently asserts similar results with blue pus—indicating that in certain infectious maladies at least some portion of the morbid principles are eliminated by the urine. The animals thus vaccinated prove protected against any primary inoculation of the disease. The separate nature of these morbid agencies from micro-organisms is shown by studies of Charrin and Ruffer, ³_{Oct.13} who are able to reproduce pyocyanic disease by inoculation of the urine freed from micro-organisms by careful filtration. Teissier and Roque, ³_{July 25}; ⁶_{Aug.25} following the general methods of Bouchard in sixty-five experiments upon the character of albuminous urine, state that the injection of such urine is followed by different results from those upon injection of normal urine. The most highly toxic urines are apparently those con-

taining the most nitrogen, and in some instances the toxic effects are proportionate to the amount of contained albumen.

Thudicum³_{July 4} confirms his previous experiments, in the isolation of the alkaloidal proximate principles of the urine, naming, as results of his investigations: urochrome, the coloring matter of the urine, and its products of decomposition, urotheobromine, creatinine, reducine, parareducine, and aromine. The method of solution is, briefly—after dilution and acidulation of the urine with sulphuric acid, the alkaloids are precipitated by a concentrated solution of phosphomolybdic or phosphotungstic acid. The precipitate is collected, washed, and decomposed by a mixture of barium hydrate and carbonate with the aid of gentle heating, taking care not to have an excess of the alkaline hydrate in the liquid. The solution is then filtered and the alkaloids separated by precipitation with the mineral acids.

CHYLURIA.

Goetze¹³_{B4.217, No.3} regards this condition as dependent, in a large number of cases, on some pathological (inflammatory, atrophic, or functional) affection of the liver, but grants the possibility of a traumatic or parasitic origin as well. In support of his position he publishes a case analogous to the one of Rossbach's. The patient, a factory hand, a young woman of good build, who had never lived beyond Thuringia, of excellent family and personal history, was never sick until her sixteenth year, when she had an attack of measles. After this she had, from time to time, hystero-epileptic seizures and frequent rheumatic attacks, which lasted from three to six weeks, with cardiac palpitation from the first. In May, 1884, she first appeared at the clinic at Jena, in apparent health, suffering from slight mitral insufficiency, and with an area of hepatic dullness somewhat enlarged. The hystero-epileptic attacks presently disappeared under treatment. Four weeks after her admission, her urine, heretofore presenting no abnormality, was noticed to be cloudy and milky. In August she was carefully examined again. The liver dullness now showed a somewhat diminished area; her physical symptoms were otherwise unchanged. The urine continued to be milky, and presented surface coagulation in varying lengths of time; never coagulated in bladder. Color varied from straw to dark red; no blood. Quan-

tity usually diminished, at times increased. Fat always present, but seldom above 0.1 per cent. (1.5 to 2.0 grammes); later it once rose almost to ten grammes. Microscopically there appeared to be a fine net-work, between the threads of which passed currents in which were to be seen small fat-drops about the size of a red blood-corpuscle. At times the urine contained albumen in varying quantities (serum-albumen and propeptone), no peptone, no sugar. Neurin, lecithin, cholesterin, as well as leucin, tyrosin, and cystin were found. From these appearances the author concluded that the chyluria had occurred at a position in which the fat and albuminous materials might be mingled and the formed elements which had contained these principles retained—in other words, in the kidneys. The absence of sugar was evidence against the admixture of lymph; so, too, the fact that in a clear filtration albumen was not retained. The occasional large percentage of fat (the maximum of fat in lymph being 0.2 per cent.) and the suppression of the normal urinary salts are also both antagonistic to the idea of lymph admixture. Goetze asserts the possibility of the liver being implicated in the production of this symptom from the appearance of the urine and the results of physical examination in this case, from other cases which he refers to, from the fact that where chyluria is endemic there liver diseases are rife, and, too, from a lengthy series of experiments, in the course of which he found that puppies which were passing fatty urine were almost if not quite invariably found to have chronic inflammatory disease of the liver.

In a case aged twenty-five years, in whom the chyluria had existed for five months prior to admission into the hospital, Wilkens³⁷⁰_{v.50, No.7} noted that the urine passed during the day was always clear, but invariably became milky toward morning. Examination of blood showed considerable increase of white blood-corpuscles, some decrease of the red; no filariæ could be found either by day or night; granulations, apparently minute oil-globules, were constant, and several times masses, as of fibrin, were found in the blood. The urine was milky, acid, specific gravity 1029, and contained unchanged albumen; on standing a creamy scum formed on the surface. The albumen varied between 0.27 per cent. and 0.60 per cent.; fat, between 0.36 per cent. and 0.76 per cent.; urea, 2.97 per cent. and 2.59 per cent. It was noted that

whenever the patient remained quiet and the bladder was relieved every hour the urine remained free from fat; that, on the other hand, it became milky after exercise, or if it was kept in the bladder the whole night. If the patient turned night into day the day's urine then became of the same character as that of the night formerly. No bacteria were found in the urine to cast any light upon the symptom. Upon fasting, no change in the amounts of fat and albumen could be noted. The fact that upon rest and constant withdrawal of urine disappearance of the chylous appearance of the urine took place, while exercise and comparative retention resulted in constant stretching of the bladder-walls, suggests to us the marked possibility of the presence of a lymph-fistula in the walls: but, on the contrary, the remarks of Morner upon this case are of force—that at times the amount of fat was too great to be explained by simple admixture of lymph. It is of significance in this case, too, that the fluctuations in the amount of fat were attended by corresponding fluctuations in the albumen.

An interesting case, evidently caused by traumatic lymph-fistula in the vesical wall, is published by Gross⁹_{June 16} in the person of an Italian woman in whom the symptom had persisted for some time, although improved for a while under gallic acid administration. To prevent coagulation in the bladder, a double catheter was passed for the purpose of washing it out, and upon the first introduction a calculus of considerable size was found. Upon removal through the dilated urethra the calculus had to be broken, and it was found that it was deposited about a hairpin as a nucleus, and that the sharp ends of this instrument penetrated the vesical walls to a considerable distance before being surrounded by calculous material. *Filaria* had been searched for but not found. The calculus weighed, including all the fragments and lesser *débris*, five hundred and forty grains. It was composed of mixed phosphates, urates, and fats.

Schenbe¹³_{Mar. 15} and Boyd²⁸⁵_{Apr. 15} each publish a case of parasitic origin. The former believes the admixture of chylous material to occur from a primary impaction of the embryonal parasites in the thoracic duct or one of its branches. Following this, the peripheral lymph-vessels become dilated by the stagnant lymph; these dilations influence the production of more and more marked dilations, which finally rupture, and usually in the vesical walls.

Grimm,²⁰_{Feb. 2} comes to the same conclusions as to the origin of the milky appearance. He bases his arguments upon the intimate relations between the fat found in the urine and the fat consumed in the food, variations of the latter in quality and quantity being followed by like changes in the urine. These circumstances point, in the author's opinion, rather to an intimate and direct mingling of the lymph with the urine, as through rupture of a lymph-vessel, than to a defective renal function or altered blood composition.

In Grimm's case there were noted the embryos and individuals of a parasitic nematoid, *Filaria Bancrofti*. They were noticed for the first three days of observation, then disappeared for five days, reappeared for two days, and were again absent for a single day. They were seen in both day and night urine. The embryos seen had generally the form and size described by other observers (0.2 millimetre long and 0.008 millimetre broad). Although hundreds of the filariæ were seen, in this instance none were observed with ciliated forward extremities, and in the same way the author failed to note the sack-like appendage described by many writers as found upon the tail-end of the creature.

Murata³¹⁹_{Mar. 24} has had an opportunity of performing section upon a case dead with evidences of filarial occupation and chyluria. He found marked dilatation of the lymph-vessels of the retroabdominal and pelvic regions, in the right spermatic cord, and right inguinal region. In the right kidney there was found degeneration of the glomerules and of the urinary canals. Murata would make the duration of filarial infestation extend over a period of ten years; there may, however, be intermissions of a full year's length. He commends rest, good, nourishing diet, and suggests nitropicrate of potassium as possibly of service.

A case of hæmoptysis with recognition of the filariæ in the sputum was met with by Yamane,³¹⁹_{Mar. 24} and may be mentioned as illustrating the possibility of a filarial causation of hæmoptysis.

HÆMOGLOBINURIA.

The etiology of this affection has received considerable attention, especially at the hands of a number of French pathologists, and the several theories of systemic and renal cythæmolysis, as stated in the last edition of the ANNUAL, continue to be the principal point of discussion—especially in regard to the paroxysmal

variety. The possibility of a hæmoglobinuria of renal origin is generally acknowledged, and Lépine,³_{Feb. 24} who insists upon the systemic origin of the paroxysmal variety, contributes the results of a research of his as a proof of this possibility. He introduced into the two ureters of a dog two tubes conducting to separate vessels, one containing sterilized saline water, the other ammoniacal urine. The experiment was continued for three hours and the tubes withdrawn. The urine in the salt solution was normal, that in the fermented urine in a condition of hæmoglobinuria. The absence of systemic cause is evident, and the fact that ammoniacal solutions tend to preserve the corpuscular elements of the blood precludes the solution of these corpuscles after deposit in the vessel the seat of ammoniacal change. Whatever the cause, then, of this instance, its site of origin must have been renal. In the large class of cases, however, this author cannot explain the train of symptoms by any other view than a systemic cythæmolysis, with the renal functions playing no other part than that of excretion. Hayem³_{Feb. 24} and Robin,³_{May 18} on the contrary, while admitting a class of hæmoglobinurias of toxic nature due to systemic blood solution, regard the paroxysmal hæmoglobinurias *a frigore* as invariably of renal origin, the former associating some cause as yet unknown for the hæmatic solution after secretion, the latter urging the necessity of the pre-existing general nutritive alteration (predisposing) followed by a renal congestive or otherwise pathological condition (exciting). Hayem³_{Feb. 24} believes that in instances of massive destruction of the red blood-corpuscles, as in some of the toxæmias, a sufficient hæmoglobinæmia is produced to explain the hæmoglobinuria, but that in ordinary cases there could not be sufficient destruction within the vascular system to account for the urinary condition; and Robin³_{May 18} points out that those cases dependent upon a hæmoglobinæmia do not occur as the paroxysmal variety, but at the beginning or in the course of certain affections, and are followed by a congestive nephritis.

In support of his views, this last writer reports a post-mortem examination of an instance of hæmoglobinuria occurring in a woman with an old interstitial nephritis, and who died from a pneumonia.³_{May 9} The patient had for years been the subject of low nutritive functions from the existence of a stricture of the lower part of the œsophagus. On section of the kidneys the

operator discovered multiple insular areas of congestion, which he regarded as the determining cause of the condition of the urine.

Griffiths ⁶_{Feb.4} has been able to demonstrate a valuable case tending in a measure to confirm Robin's views. A man exposed to severe cold, with no malarial taint, developed an intense hæmoglobinuria, entered the hospital, and died in a comatose condition within thirty-six hours. The urine was loaded with albumen, and besides the hæmoglobinuria showed some few red blood-corpuscles. The kidneys, on post-mortem section, twenty-eight hours later, were large and looked as though they had been macerated. There was some slight interstitial overgrowth. Beneath the capsule, in places, in some of the lymph-spaces, there was deposited a homogeneous material. Leucocytes were more abundant than usual in some of the small vessels and some were pigmented. In some of the larger and smaller vessels there was a distinct disintegrative process going on leading to alteration in the walls and entire destruction of them. The character of the blood and these appearances showed an intravascular blood degeneration. The presence of fine pigment in the tubules with few or no red blood-corpuscles (although corpuscles are seen distinctly in neighboring capillaries) showed that the corpuscles are not destroyed in the tubules.

Germoing ²²_{Aug. 29} has reported the post-mortem upon the person of an artisan, aged sixty years, with a syphilitic history, subject to paroxysmal hæmoglobinuria, first brought on after a severe chilling three years before. Since then attacks could be induced by the Boas-Ehrlich method. The kidneys were found in a healthy condition except for some amount of hæmic pigmentation of the tubular epithelial cells, and a coagulation necrosis of a number of the renal cells, causing the appearance of vacuolization.

A case of some weight against Lépine's views was related by Millard ³_{May 18} in which the primary and, too, the subsequent attacks were caused by cold. At each attack there would be several micturitions of stained urine, and then the seizure would pass off. The amount of urinary coloration and the rapidity of the disappearance could not have permitted, in Millard's view, of a general blood degeneration, but would point to a local renal focus of the degenerative process.

Prior, of Bonn,³⁴_{July 24; Aug. 7} has published a valuable contribution in the records of a case studied by him, that of a man aged forty-three years, without syphilis or any tubercular taint. In 1884 he was taken ill with a severe chill and pain in the lumbar region and down the legs, followed by fever. The pains disappeared in a few hours. The urine of the following night was dark, like porter, but cleared up the day following. He was under Prior's observation from March, 1885, until in December of the same year, when he died of hæmoptysis, caused by tuberculosis of the lungs, which he had developed under Prior's notice. On section the only abnormality was a marked general tuberculosis. The kidneys were carefully examined, but failed to reveal anything of note. Prior had an opportunity to make a careful study of twelve of the seizures of hæmoglobinuria. Of these, eight began with a chill, one with fever, and three without prodromes. Five were caused by exposure to cold, three by excessive exertion, one by exertion and wetting, and three apparently without cause. The temperature rose to fever height in ten cases, its duration varying from one and one-half to eight hours—the higher the temperature and longer its duration, the more intense the hæmoglobinuria. The reaction of the urine in each instance was acid. The coloring matter was, in most cases, methæmoglobin; in several, oxyhæmoglobin, or a mixture of the two. The staining occurred at the height of the fever. The specific gravity of the urine varied from 1012 to 1021; the amount decreased during the attack, but was followed by an increase the next day, the urea and other solids showing the same fluctuations. Albumen was uniformly present, as serum-albumen and, in smaller quantities, paraglobulin. In half the attacks the spleen and liver were enlarged and tender, persisting for a short while after the attack. Jaundice occurred twice. During the seizure the heart's action increased, the pulse was small, the respiration disturbed, and nervous symptoms manifested themselves. The time of the appearance of the coloring matter in this case may be of significance.

Branc³_{Aug. 8} has recently made a number of experiments tending to prove that the resistance of the red blood-corpuscles to the separation of the hæmoglobin varies with the systemic temperature, increasing with increase of temperature, and showing that simple hyperthermia is in reality attended by diminution of blood changes.

From such a view it is not improbable that in Pryor's case the separation of the coloring material and the fever were both due to a pre-existing common cause—whatever that may have been. It would be of considerable interest to note in this connection the relation borne by the adrenal bodies and their sympathetic ganglia, the general train of symptoms suggesting the possibility of an acute involvement of these organs.

Cases apparently caused by the action of cold, associated in several instances with excessive muscular exercise, have been reported by Bucquoy, ⁷³_{Feb. 18}, Socor, ²²³_{June}, Salle, ³_{Apr. 18}, Matienzo, ⁶_{Aug. 18}, Bermondy, ²¹²_{Oct.}, Lépine, ¹⁴_{Jan. 15}, Charpentier, ⁶_{July 28} and Hayem. ³_{July 18} Of the eight cases included, two were syphilitic. The last case, that of Hayem, presented certain peculiarities which led the author to regard the cause as probably of a specific nature, and recovery speedily followed the exhibition of antisymphilitic treatment. A further peculiarity in this instance persisting long after the urine had cleared was the coloration of the serum, tending to overthrow Lépine's idea that such a hæmoglobinaemia is productive of hæmoglobinuria. Hayem has seen the same phenomenon in a case of subacute nephritis, and again in a case of cardiac disease with secondary hepatic congestion, without the appearance of hæmoglobinuria. Another form of bloody urine, a renal hæmaturia, due to renal syphilis, is recorded by Hill. ²_{May 28} The second syphilitic in the list of paroxysmal cases produced by cold was demonstrated by Lépine before his class, before whom he took occasion to urge his belief of a pre-existing hæmoglobinaemia, produced by the dual action of cold and some general predisposing cause, as syphilis or malaria.

In two of the remaining six there was marked rheumatic history (Bucquoy, Bermondy), in the first the urine remaining normal so long as the subject remained within doors, but becoming stained whenever exposure to the outside temperature was experienced; the second occurring in a previously healthy *gendarme* aged fifty-two years, continuing for nine or ten days, the patient continuing ill with a number of complications for more than a month longer. In the case reported by Charpentier, the subject, a man of thirty-five years, was in general poor health, due to bad hygienic surroundings, when the first attack was induced by exposure to cold and wet. Removal to better surroundings was followed by a

complete cure not only of the hæmoglobinuria, but also of an albuminuria *post-cibum*, which persisted until influenced by hygienic agencies associated with an artificial gastric ferment.

Hayem ³_{Feb. 18} has recently seen an attack of hæmoglobinuria not caused by cold occur in an acute attack of articular rheumatism complicated by pneumonia and pericarditis. The blood-serum in this instance was not stained, and Hayem regarded the cause as a renal lesion associated with an increased blood pressure. Robin has seen two cases occur in the course of attacks of rheumatism, one of which presented markedly congested kidneys upon post-mortem examination. The case recorded by Matienzo occurred in an old man aged seventy years, and was first produced by great fatigue and chilling, and had existed for six years without any marked effect upon the general health. In the case narrated by Socor, occurring in an engineer aged forty-five years, the primary attack was induced by exposure to cold during fatigue, and there after any exercise of the lower members, especially in the winter, served to precipitate an attack.

Within the last year Robin ³_{Apr. 18} has met with an instance of hæmoglobinuria brought on in a young man by walking. During rest the urine remains normal, but a walk of several miles always produces the symptoms. Upon one occasion after walking a considerable distance the patient experienced severe pain in the lumbar region, followed by the expulsion of several small fibrinous masses containing crystals of oxalate of lime, probably the nucleus for a calculus. This incident would suggest that hæmoglobinuria would favor the formation of renal calculi, and should be regarded as an important point in making up a prognosis.

Ballet ³_{May 9} reports a case of paroxysmal hæmoglobinuria occurring in the course of a severe jaundice in a child aged eleven years, pointing toward the hæmoglobinæmic theory as possibly caused in this case by a species of autointoxication.

But little of interest upon the hæmoglobinuria of malarial intoxication has been contributed within the past year to literature. Day ¹²_{Feb.} reports a case of hæmoglobinuria in a child following a primary malarial paroxysm of the day previous. In the inability of the stomach to retain quinine, the drug was pushed by the rectum with success.

Canellis, ¹⁹⁵_{June} in speaking of hæmoglobinuria mentions that in

Greece this affection (of malarial origin) has an average mortality of 22.4 per cent. It is especially met with among those persons who have been long infected by the miasm.

Quinine in too severe dosage has been known to cause it. Pampoukis and Chomatianos, of Athens, ⁷³_{July 7}, in relation to this last point, make positive statements, instancing a number of cases in which careful observations were made as the basis for their assertions. In the experience of these writers, *sulphate of quinine*, in doses of half a gramme or more, has produced a hæmoglobinuria lasting twenty-four hours. With six doses, each 0.05 gramme, a slight hæmoglobinuria lasting five or six hours was produced. With small doses (0.02 gramme) this symptom did not appear at all. *Hydrobromate of quinine*, in doses of 0.8 gramme, taken internally, does not produce the phenomenon, nor does a hypodermic injection of 0.3 gramme succeed. But above these limits an abundant hæmoglobinuria was induced in one case. *Tannate of quinine*, in doses of one gramme, caused a free hæmoglobinuria in a single case, but failed in others. *Cinchonine* in even quite large doses (two grammes) did not induce the symptom. *Sulphates of cinchonine*, or *cinchonidia*, or *quinidia*, up to doses of one gramme, did not produce it, but invariably caused a feeling of weight in the renal regions. *Quinquinia* in very large doses failed in producing the conditions. From these observations the authors conclude the advisability of employing cinchonine or antipyrin in cases having an idiosyncrasy to quinine. The authors divide this class of cases sharply from those of malarial hæmoglobinuria, in that the latter occurs in those not taking quinine and disappears on employment of this drug, and, further, that this class occurs in those using quinine and may appear even after the cessation of the drug. Raymond, ⁷⁴_{May}, in the treatment of the malarial hæmoglobinurias, urges the futility of quinine and commends a supportive and expectant plan of action.

Babès ³_{Sept. 17} mentions a form of hæmoglobinuria prevailing among the cattle of Roumania, somewhat resembling the ordinary cattle-plague, but showing the constant presence of a bacterium which Babès regards as probably the pathogenic agent.

HÆMATURIA.

Lydston, ²⁰⁷_{Apr.} in a clinical lecture upon this subject, reports

three cases due to prostatic engorgement; and Hill⁶_{May 20} mentions two cases of vesical origin, caused respectively by papilloma and epithelioma of the bladder. Besides these cases from vesical neoplasms, this writer records an interesting case due to Bilharzial occupation in a woman, aged thirty-nine years, who had never lived out of England at all. In 1886 her catamenia became disordered and were delayed fourteen days, following which she had a severe hæmorrhage *per urethram*. The bleeding having continued at intervals for more than a year, she entered the hospital in February of 1887, and in March the ova were first noted in the urine. By April these ova had disappeared, and, the urine appearing normal, she returned home, where she died the following August, after an unknown illness of three days' duration, with violent pains in the belly—possibly from an extended peritonitis from pericystitis caused by the Bilharzial presence.

Handford²_{June 2} reported that the case narrated last year in the ANNUAL continues to show the ova in the urine. The value of this last case as a means of determining the duration of Bilharzial infection loses somewhat since the announcement of the above case of apparently indigenous origin.

Allen, of Pietermaritzburg, in South Africa,¹⁵_{Apr.} believes that the invasion of *Bilharzia hæmatobia* is purely a local one—that the parasite lives and breeds solely in the urinary tract, and not in the circulatory system. He finds the condition especially in boys who bathe in the muddy pools near his locality, and commends circumcision as a preventive measure, as the prepuce possibly is the primary lodging-place of the parasite. Circumcised cases seem in his experience to be particularly free from this form of hæmaturia.

Peiper and Westphal³¹⁹_{Feb. 25} report a case of hæmaturia in a sickly boy of nine years, due to rhabdites. The organisms were found only in the urine.

Oliver²_{May 26} reports an interesting case in a young girl, aged eleven years, possibly from typhoid intoxication. The girl had been exposed to possible infection from her brother; she presently was taken severely ill, and for thirty-five days hæmaturia ran along with a high temperature, and upon the fall of fever disappeared entirely and completely.

McKeough²⁵⁷_{Apr.} records two instances of hæmaturia in malarial cases, each clearing up under the use of quinine. In the first case,

a woman aged thirty-six years, healthy and without hæmorrhagic tendency, the attack came on apparently without any general disturbance, but was followed several days later by an undoubted paroxysm, and the patient had several attacks within a year without fever. The second case, a child aged three years, female, had a malarial paroxysm in the afternoon of the first day of illness, another the following afternoon, accompanied by a severe convulsion, and hæmaturia followed this second paroxysm.

A very interesting case of possible malarial hæmaturia is related by Sanford, ⁷⁴_{Feb.} occurring in a newly-born infant, cyanosed when born, but readily resuscitated. His condition for the next twenty-four hours remained good, except that he passed no urine, was a little restless, and nursed vigorously. Then he passed a large quantity of apparently normal urine; but the restlessness increased, the temperature rose as high as 105° F., and vomiting of a bilious matter occurred, and the child became jaundiced and passed bloody urine. This continued for four days and nights, accompanied by a train of nervous and febrile symptoms, after which the temperature fell and the phenomena gradually disappeared within a few days. Sanford notes that a few days before confinement of the mother he had treated her for a mild attack of malarial fever, which had yielded kindly to treatment. The urine in the case of the infant, not examined microscopically, had a turbid, coffee-colored appearance which the author regards as differentiating the condition from one of hæmoglobinuria.

Moyer²³¹_{May} reports a case of hæmaturia occurring in a child of five days, without any appreciable cause except that the infant was small and puny (one of twins). The temperature remained normal and the appetite good; there was no tenderness evinced anywhere. On the fifth day a slight icterus set in, unassociated with any disturbance of health; it disappeared in several days, the urine cleared up, and the child rapidly recovered.

In the diagnosis of the seat of urinary hæmorrhage and of vesical growths Fenwick, ²_{June 16} in an article upon the instrument, commends the use of the electric vesical endoscope.

In a case of hæmaturia, probably from vascular rupture in the upper urinary tract, Bauer⁵¹⁴_{Nov.} reports a successful result from the use of ergot.

Didama⁹_{May 26} commends the employment of alum in the same

class, taking care that it be well diluted, so as to be readily taken into the circulation, and not act toward the production of constipation.

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